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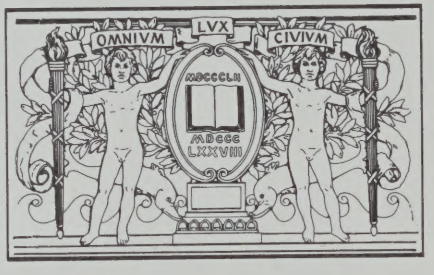
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SOUTH SHORE RAIL RAPID TRANSIT EXTENSION

Preliminary Impact Study

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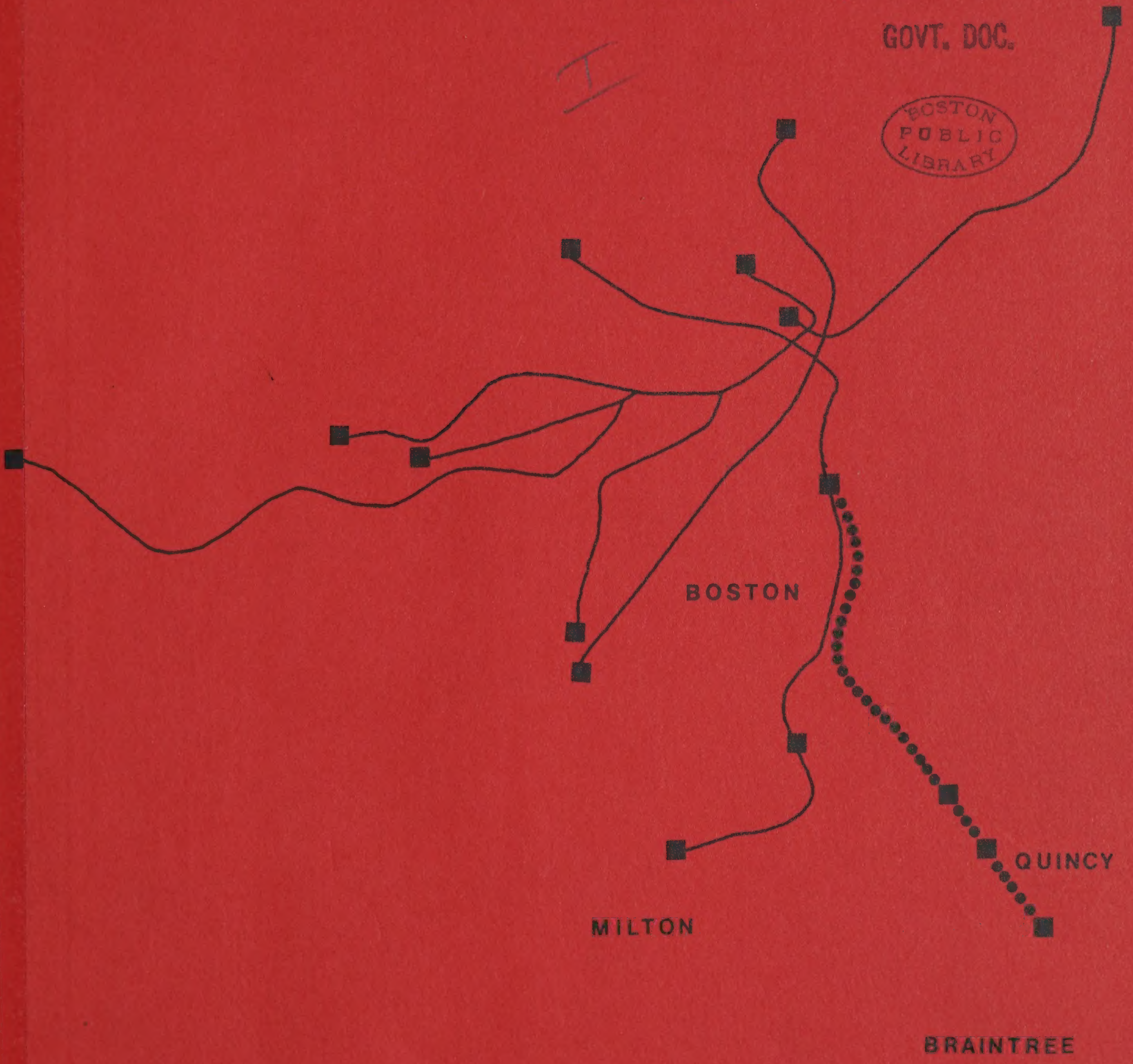
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MASSACHUSETTS BAY TRANSPORTATION AUTHORITY

by:

METROPOLITAN AREA PLANNING COUNCIL

October, 1973

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SOUTH SHORE RAIL RAPID TRANSIT EXTENSION
PRELIMINARY IMPACT STUDY

PREPARED FOR:

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY

BY:

METROPOLITAN AREA PLANNING COUNCIL

October 1973

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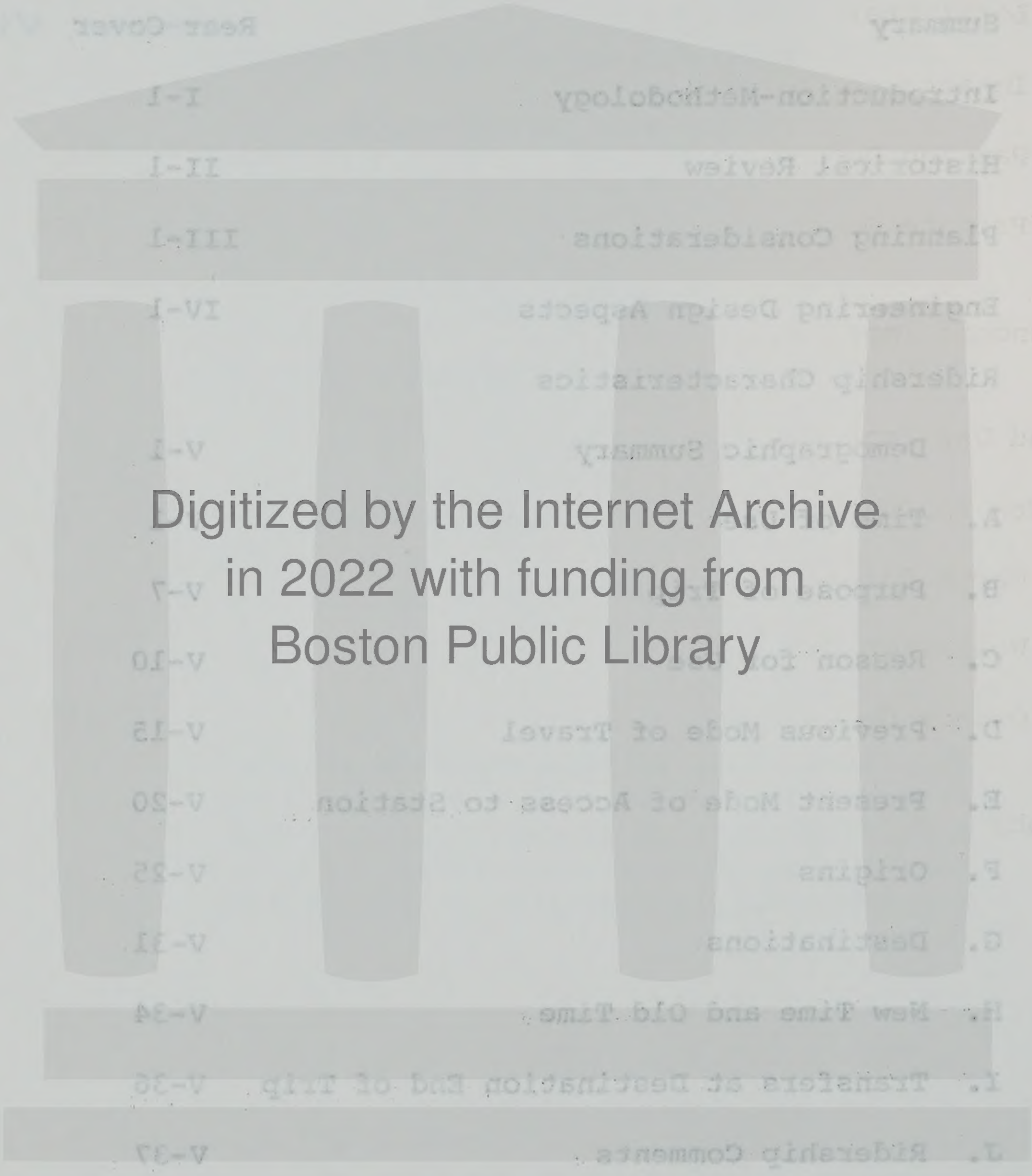

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CHAPTER I

INTRODUCTION - METHODOLOGY

The Metropolitan Area Planning Council (MAPC), as the officially designated regional planning agency for the Boston Metropolitan area (a 100 - Community area), and the Massachusetts Bay Transportation Authority (MBTA) as the agency planning for and providing transit facilities and services for this metropolitan area; share a major responsibility for assuring consistency between transit programs and comprehensive regional planning, and between transit services and sound regional growth.

The first phase of MBTA's South Shore Rapid Transit Extension, which opened to Quincy in 1971, was the Authority's first high speed rail rapid transit link between Boston and the suburban communities on the South Shore. Realizing that a project of this magnitude would have far reaching effects on transportation and regional growth, the MBTA contracted with the MAPC to study the impacts related to the transit extension. This study was financially assisted by the Urban Mass Transit Administration (UMTA). The major goal of the study is to increase the understanding of impacts of this transit extension with the view towards the planning of future transit extensions.

An Interagency South Shore Task Force for the South Shore Transit Impact Study was formed consisting of the MAPC, the MBTA and the Massachusetts Department of Public Works (MDPW). A joint

South Shore Work Program was developed. The MAPC was responsible for the performance of the majority of the work items, for the overall coordination of the study and for the preparation of the final report. The MBTA assisted the MAPC in terms of advice and counsel and performed certain technical work items. The MDPW was responsible for the collection and analysis of the general highway vehicular data and assistance in its correlation with the transit patronage.

The major data source for the study was a ridership survey. The staffs of the MBTA and MAPC combined to develop the survey questionnaire, (Figure I-A). The survey questionnaire was developed to determine a variety of ridership characteristics and transit extension impacts; i.e., time of use, mode of transportation to station, previous mode of travel, origin, destination, reasons for use, purpose of use, propensity to transfer, time saved or lost, and a variety of socio-economic characteristics. A sample questionnaire appears on a following page.

The questionnaires were randomly distributed to riders at the three South Shore Extension stations in Quincy between the hours of 5 A.M. and 2 P.M. on Tuesday, April 27th, 1972. The survey was intended to determine the characteristics of the inbound ridership and the outbound or "reverse ridership" during the period of day when most riders are travelling in the inbound direction.

Responses to the ridership survey were very high. During

[illegible]

[illegible] overall coordination of the study and for the preparation of the final report. The MBTA assisted the MAPC in terms of advice and counsel and performed certain technical work items. The [illegible] was responsible for the collection and analysis of the general highway vehicular data and assistance in the overall [illegible]

The major data source for the study was a ridership survey. The [illegible] of the MBTA and MAPC combined to develop the survey questionnaire, (Figure I-4). The survey questionnaire was developed to determine a variety of ridership characteristics and transit automobile impacts; i.e., time of use, mode of transportation to station, previous mode of travel, origin, destination, reasons for use, purpose of use, propensity to transfer, time saved or lost, and a variety of socio-economic characteristics. A sample questionnaire appears on a following page.

The questionnaires were randomly distributed to riders at the three South Shore Extension stations in Quincy between the hours of 5 A.M. and 2 P.M. on Tuesday, April 27th, 1972. The survey was intended to determine the characteristics of the inbound ridership and the outbound or "reverse" ridership mainly the period of day when most riders are traveling in the inbound direction.

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MBTA RIDERSHIP SURVEY

Please answer all questions and return by mail.

At what time were you handed this questionnaire? ________ hr. ________ min.

Where do you live? ____________________
town/city or section of town

002785

What is your main reason for using the South Shore line? (Please check only one answer)

☐ Avoid traffic
☐ No bus available
☐ No auto available
☐ Less travel time
☐ Goes directly to destination
☐ Reduce cost
☐ More comfort
☐ Avoid downtown parking
☐ Other ________________ Please explain

How did you get to your boarding station?

☐ Drove and parked in MBTA lot or garage
☐ Drove and parked in private lot or garage
☐ Drove and parked on street
☐ Was dropped off
☐ Car pool passenger
☐ Bus, Route No. ______
☐ Taxi
☐ Walked
☐ Other ________________ Please explain

At what station do you leave the rail rapid transit? ________________
Name of Station

What is your final destination? ____________________
No. & street or building / city or town

Will you transfer to a bus to reach final destination? ☐ Yes ☐ No

Purpose of this trip?

☐ Work
☐ Shopping
☐ School
☐ Personal business
☐ Social/recreation
☐ Other ________________ Please explain

Before this South Shore line opened, how did you usually make this trip? (Please check the one most frequently used.)

☐ Auto driver
☐ Auto passenger
☐ Drove car to MBTA station
☐ Dropped off at MBTA station
☐ Did not make this trip. Why not? ________________
☐ MBTA bus to MBTA station. Which station? ________________
☐ Non-MBTA bus. Which bus company? ________________
☐ Other ________________ Please explain

How many minutes does your total trip usually take? (Time door-to-door, one-way) __________ minutes

How many minutes did this trip use to take before the South Shore line opened? (Time door-to-door, one-way)
__________ minutes

As a result of the opening of this South Shore line, did you?

☐ Relocate your housing
☐ Take a new job
☐ Sell an auto
☐ Change shopping habits
☐ Change schools

Did you or your family? ☐ Rent ☐ Own your home

Was a car available for your use for this trip? ☐ Yes ☐ No

Including yourself, how many persons are in your household? ________ (number)

Your age?

☐ 0-16
☐ 17-19
☐ 20-24
☐ 25-39
☐ 40-64
☐ 65+

What is your family annual income?

☐ less than $3000
☐ $3000 - $4999
☐ $5000 - $9999
☐ $10,000 - $14,999
☐ $15,000 - $19,999
☐ $20,000+

gestions for improved service

____

____

YOUR PARTICIPATION IN THIS IMPORTANT SURVEY IS APPRECIATED
For assistance call 722-6583

the survey hours of 5 A.M. to 2 P.M., the total sample size is 46% of the ridership population. The distribution of actual ridership entering the transit extension stations as determined by hourly turnstyle counts is proportionate to the distribution of surveyed ridership as shown in Table I-1.

Table I-1

Survey Questionnaires vs. Turnstyle Counts

Station	% of Riders by Turnstyle Counts	% of Returned Questionnaires by Station Entered	Number of Questionnaires Returned
North Quincy	19	21	823
Wollaston	26	26	1,018
Quincy Center	55	53	2,076
Totals	100	100	3,917

The data compiled from the survey also compared favorably with a variety of known characteristics (from the 1970 U.S. Census) about Shouth Shore commuters and South Shore residents in general. Therefore, considering the very large sample (46%) and its consistency with known characteristics, it was decided that an expansion of the survey data to reflect total daily inbound ridership would be a valid representation of ridership characteristics and impacts.

The MDPW provided the figures for the Traffic Impacts Chapter. Originally, the MDPW intended to have a three-part traffic analysis, i.e., before the opening of the line, three months after the opening (November 1971) and again in November 1972. Unfortunately,

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[illegible]

because of a lack of funds the November 1972 traffic count was not made. The data, however, from the November 1971 count does indicate the impact of the transit extension on traffic patterns and volumes to that date. Lack of 1972 data notwithstanding, where feasible, comments are offered on traffic impacts in terms of the present time.

Similarly, the economic data for the City of Quincy was only available in the desired form to the year 1971, i.e., three digit standard industrial code data by industry, by town. As with the traffic data, where possible, the economic data has been brought up to date.

To conclude, the analyses that were drawn from the data supporting this study are considered valid subject to the limitations mentioned above, and where possible, either by personal interview or related studies, the data base has been updated to the present time.

CHAPTER II

HISTORICAL REVIEW

The Old Colony Railroad from Boston to Plymouth was opened on November 10, 1845. The railroad trip to the South Shore significantly shortened travel time and commuting to Boston became more practical. Accordingly, many people began to live in the country and to commute to the city for work. Thus, the opening of the Old Colony Railroad aided in the growth of the South Shore as an important suburban region.

As travel increased over the railroad from Boston to Quincy, the number of tracks were increased from two to four, and additional stations were added to the route.

On February 7, 1888, the selectmen of Quincy granted the Quincy and Boston Street Railway Company a franchise to lay tracks from the Neponset Bridge to West Quincy along Hancock, School, Franklin, Water, Copeland and Willard Streets. On December 2,1905, the Quincy cars were routed over Boston Elevated Street Railway tracks all the way into Dudley Street Terminal from Neponset. The trip to the downtown area was completed over the new elevated line along Washington Street. Therefore, by the turn of the century, public transportation from Quincy to Boston consisted of two modes: commuter railroad and street transit services. This would be the pattern for the next 60 years.

In 1893, the New Haven Railroad leased the Old Colony Railroad. The Old Colony Division was owned and operated by the

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[illegible]

the New Haven Railroad until the purchase of the right of way from Boston to Braintree by the MBTA in November, 1965.

In the 1920's, further rapid transit railways were constructed in Boston. On November 5, 1927, the Boston Elevated Railway opened the Dorchester Extension as far as Fields Corner Station. The line opened to Ashmont Station on September 1, 1928, and a further extension to Mattapan using streetcars commenced operation on December 21, 1929. With the opening of the Dorchester Extension, Quincy streetcars were cut back from Dudley Station to Fields Corner. This extension of the rapid transit, which used parts of the Old Colony right-of-way, in Dorchester, was a pioneer effort in the utilization of a railroad right-of-way for transit purposes.

From the mid 1920's to 1945, patronage on both the Old Colony commuter trains and the Quincy to Boston trolleys fluctuated, i.e., down during the depression and up during the war. In April 1945, a major study of Metropolitan Boston's post-war transit requirements was completed by the Metropolitan Transit Recess Commission. The results were published in the "Coolidge Commission Report". There were numerous recommendations contained in the report, among them was a new rapid transit line which would diverge from the Harvard-Ashmont line near Savin Hill and run to South Braintree along the Old Colony roadbed. A subsequent report issued in 1947 repeated the recommendation, but little immediate action was taken.

Meanwhile, the post-war era brought an enormous increase in automobile use, and the mass transit services of both the Eastern Massachusetts Street Railway Company (EMSR) (which had completely replaced streetcars with buses by 1908) and the Old Colony's commuter trains were seriously affected. The reaction of both companies was a decrease in service by eliminating certain unprofitable routes, or reducing the number of buses and trains in operation. In May, 1958, the New Haven Railroad announced that the Old Colony Division would cease operation of commuter trains in June. The continuing need for service, however, led to emergency legislation that established the Old Colony Area Transportation Commission and a $900,000 payment from area municipalities to the New Haven Railroad to subsidize the continuation of Old Colony commuter operations through June 20, 1959. On April 2, 1959 the engineering firm of DeLeuw, Cather and Company submitted a report which was intended to determine the most efficient way to re-establish railroad passenger service, or convert the line for mass transit purposes. The report recommended no resumption of railroad service but made two proposals for rapid transit operations. Both proposals were rejected after review by the advisory committee of the Old Colony Transportation Commission.

In mid 1959, the Southeast Expressway was opened from Boston to Braintree. The loss of further ridership and the refusal of further subsidies led to the discontinuation of commuter rail service on the Old Colony on June 30, 1959, after 114 years of

[illegible]

[illegible]

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operation. The 7,000 daily riders in 1959 were now forced to choose between the new expressway and the remaining bus routes of the EMSR.

After the Old Colony terminated commuter operations from the South Shore, the Commonwealth informed the New Haven Railroad that it intended to exercise the option to purchase the Old Colony right-of-way. However, the state was required by court action to have a workable plan for joint mass transit and railroad freight operations. On July 2, 1959, the Mass Transportation Commission (MTC) was created by the legislature. A major objective of the MTC was to study the problems of the South Shore transportation crisis. In general, the commission recommended rapid transit service to be extended to South Braintree, with a third track to be provided along the Old Colony branch for rail freight service. Some of the alignment was new, other portions of it utilized existing track. The plan was never adopted, but it is strikingly similar to what was eventually proposed and adopted for the South Shore.

The MTC lasted until 1964. During this time it recommended the extension discussed above and, when this failed to gather support, the MTC suggested a revival of the 1945 Coolidge Commission report which recommended rail transit to Quincy using existing track. The MTC also published reports concerning the feasibility of rapid bus ways. However, considering all the recommendations, no action was taken.

By the mid 1960's it became apparent that the existing transit facilities in Metropolitan Boston were unable to satisfy transit demand, especially from the suburban areas. In 1963, the Metropolitan Transit Authority (MTA) itself acknowledged the transportation crisis and its inability to serve suburban areas.

An MTC progress report in 1964 concluded that people would use improved transit facilities and the method to solve the transportation problem was through a comprehensive solution.

In March, 1964, the Greater Boston Chamber of Commerce and the Metropolitan Area Planning Council (MAPC) recommended the creation of a 78-community Metropolitan Transit Authority based on the work of the MTC. The new authority would have the right to issue 200 million dollars in bonds for capital improvements, with early construction priority going to the South Shore rapid transit extension. On April 21, 1964, Governor Peabody filed a bill based on the Chamber of Commerce and MAPC plan. The bill became law on August 4, 1964 and the following day the Massachusetts Bay Transportation Authority became a reality.

Also in 1964, the United States Congress enacted the Urban Mass Transportation Act. This provided for a three year capital grant and loan program for transit improvements. Under the distribution formula, Massachusetts was originally entitled to receive 47 million dollars. In 1965, the MBTA received 6.1 million dollars for station moderniaation from the Department of Housing and Urban Developments' newly formed Urban Mass Trans-

[illegible]

[illegible] 1966, the United States Congress [illegible] Mass Transportation Act. This provided [illegible] grant and loan programs for general improvements. Under the [illegible], Massachusetts was [illegible]. In 1966, the [illegible] received $[illegible] for station [illegible] from the Department of Housing and [illegible] portation Administration. This award was the first of its kind made in the United States.

In July of 1965, the MBTA and the New Haven Railroad announced an agreement on a price for the sale of the Old Colony branch, and on November 1, 1965 the MBTA purchased the necessary sections of the Old Colony Line.

Station location plans were sent to the MBTA's Advisory Board for approval in late November, 1965. It soon became apparent, however, that there was need for further discussion over the location of the transit stations. In December 1965, after much discussion with City of Quincy officials, the locations of three Quincy stations were agreed upon: North Quincy, Wollaston and Quincy Center and construction of the new extension was scheduled to begin in the spring of 1966.

In January 1966, the Advisory Board gave its approval of the demolition of the Neponset River Railroad Bridge and by late summer, the old fire-damaged bridge had been removed. The demolition of the old bridge signalled the beginning of construction of the South Shore extension.

In August of 1966, the MBTA published its $369 million Master plan (Program for Mass Transportation) which outlined the specifics of the long range program for transportation development in the Boston Metropolitan area. The South Shore program called for development in three phases, i.e., Phase I, a 9.3 mile line from Columbia Station to Braintree; Phase II, extention of the

line to Weymouth; and Phase III, a further extension to Braintree Highlands or Holbrook and/or to Rockland or Norwell. This was subsequently altered, in that, Phase I became the existing extension to Quincy Center.

On August 18, 1966, the official ground breaking for the South Shore extension took place. In the remaining months of 1966 and the early months of 1967, many construction contracts were awarded, and construction work began in Quincy in the fall of 1967. In October of 1967, the MBTA reached an agreement to purchase the Eastern Massachusetts Street Railway Company (EMSR) for 6.25 million dollars. Purchase of EMSR was considered by many to be the last obstacle to construction of the line. On March 12, 1968, the MBTA received the long awaited $35.2 million grant from UMTA for the South Shore Extension; included in the grant was $3 million towards the purchase of the EMSR which took place on March 29, 1968.

The first South Shore cars were delivered on August 6, 1969 from Pullman and Standard; they were to be the first of the eventual 76-car fleet.

Construction of the line was sluggish due to a variety of factors, i.e., heavy winter snowstorms, modifications requested by the City of Quincy, and numerous labor problems and strikes. Perhaps the most serious setback was the halt of the track construction in December, 1969 when the contractor, Railway Automated Machinery Company, declared insolvency.

By 1970 most labor and related problems were overcome and construction accomplishments were substantial. By early June, 1971 trains were making test runs over completed sections of track and on August 3, 1971 the first "Silverbirds" ran into Quincy Center Station. After extensive safety and operational tests, the South Shore Extension was opened with official ceremonies on September 1, 1971.

CHAPTER III

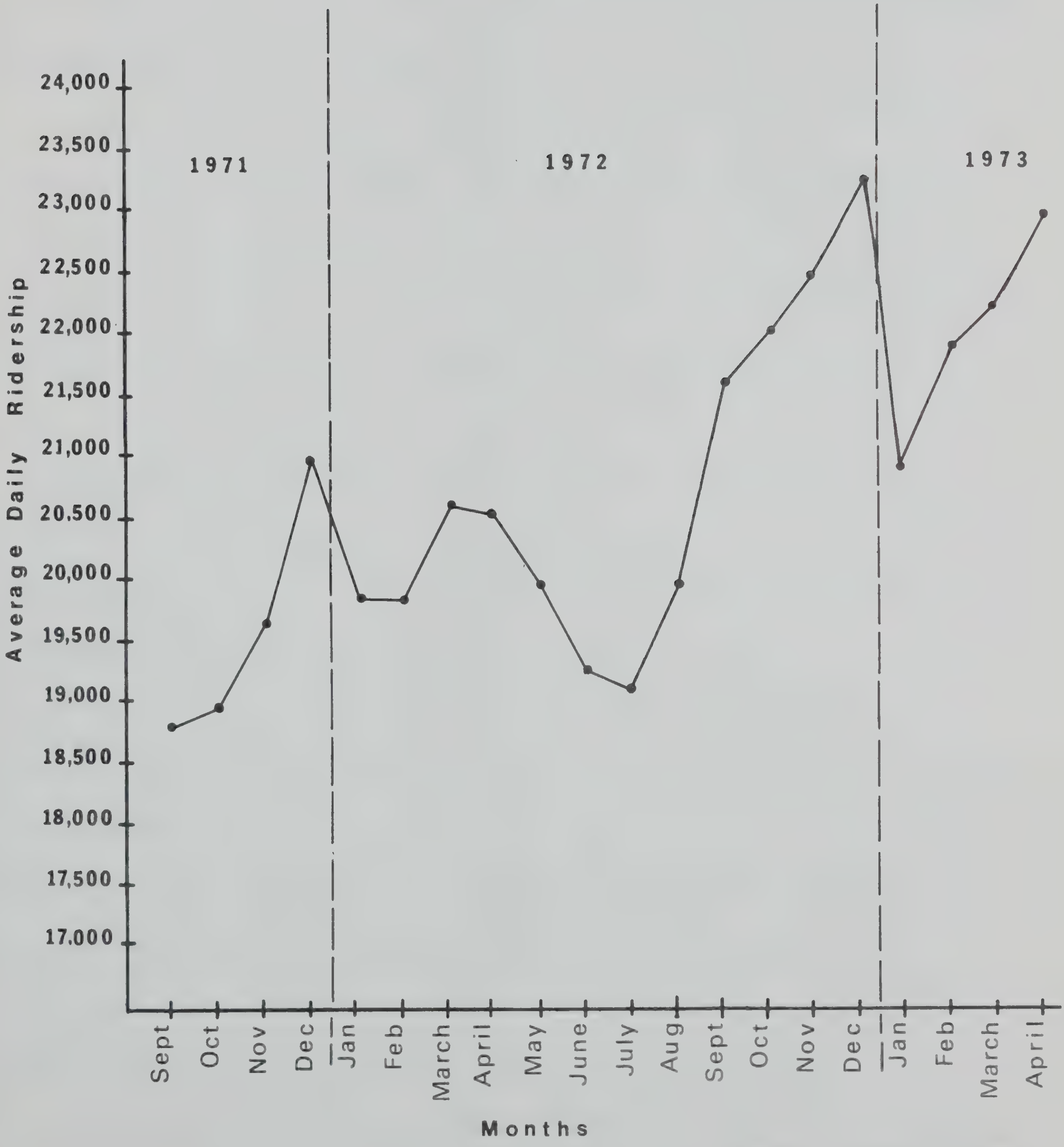
PLANNING CONSIDERATIONS

The principal conclusion of this section finds that the projections prepared for each station are now not completely valid since the stations are not functioning in the manner that was originally planned. The existing three transit stations were designed as part of a longer extension. Indications from recent studies, and this study, are that when the South Shore Extension is extended to terminal stations at primary highway routes, then, the Extension would function to service a wider range of South Shore communities southerly of Quincy. A detailed discussion of the relationship of access mode mixes to terminal stations as a function of area location is found in Chapter VI.

As noted in Chapter II, Historical Aspects, planning for a South Shore Extension covered a period of many years. The 1966 MBTA "Program for Mass Transportation, August 1966" and its accompanying "Staff Supplementary Report", defined the basic characteristics of the Extension which was ultimately build. The ridership volume projections were based on analyses of the 1963 data compiled by the Eastern Massachusetts Regional Planning Project (EMRPP) which included an origin-destination study of 152 cities and towns. The "Staff Supplementary Report" describes the manner in which the projections were made.

Figure III-A displays the average daily two-way passengers for the existing three stations from the opening(September 1971)

AVERAGE DAILY RIDERSHIP–Two way–All stations
(By Month)



MBTA - MAPC Survey
South Shore Transit Line
April, 1972

to April 1973. The average daily two-way passengers are plotted during the month of occurrence. While the data is for a relatively short period, the general trend is growth. Seasonal variations show lower ridership in the early winter and summer months, then higher ridership during the remaining months. The trend also seems to indicate overall increases as shown by comparing the September-December data for 1971 versus 1972.

Table III-1 compares the projected trip origins (1966) to surveyed trip origins (1972). In general, the table illustrates that the effective service area, as indicated in the survey trip origins percentages, is comprised of three towns (Quincy, Weymouth and Braintree) while the projected trip origin percentages indicate that a larger effective service area might be anticipated considering the longer extension originally planned. Randolph and Brockton were expected to have much higher ridership than what the survey data indicates. Also other suburban towns south of Route 128 were expected to provide more of the ridership.

It should be noted that the projected trip origin percentages were computed for a six station extension terminating in South Weymouth while the survey trip origin percentages represent ridership from the existing three station extension to Quincy Square. The six station facility would have made the extension more accessible from the major arterials, thus outlying residents would have had more convenient station access. The actual smaller current effective service area, and the lower per-of Table II-1. Commercial development [illegible] [illegible], high [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] higher [illegible] [illegible] the [illegible] [illegible]. The [illegible] [illegible] of [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

Table II-2 contains the projected high [illegible] [illegible] [illegible] daily [illegible] [illegible]. [illegible] [illegible] that the [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] and [illegible]) [illegible] [illegible] [illegible] [illegible] [illegible] the [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] were [illegible] [illegible] [illegible] of [illegible] [illegible].

It should be noted that the projected daily [illegible] [illegible] were computed for a six [illegible] [illegible] in South Weymouth [illegible] the [illegible] [illegible] [illegible] from [illegible] [illegible] [illegible] Quincy Square. The [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

TABLE III-1*

Projected Trip Origins (1966)

vs

Surveyed Trip Origins (1972)

Projected Trip Origins			Survey Trip Origins	
Number	%	Origin	% (expanded)	Number (expanded)
8112	38.5	Quincy	61.9	6868**
1990	9.2	Braintree	8.9	982
2164	10.3	Weymouth	11.0	1222
1063	5.0	Randolph	.1	12
1825	8.7	Brockton	1.6	182
775	3.6	Hingham	3.8	422
471	2.2	Hull	1.4	152
388	1.8	Holbrook	1.4	158
398	1.9	Rockland	.3	38
309	1.5	Cohasset	.9	103
321	1.5	Abington	.4	44
232	1.1	Hanover	.5	62
309	1.5	Norwell	.2	21
386	1.8	Scituate	1.3	141
294	1.4	Whitman	.3	38
115	0.6	Hanson	0.0	0
189	0.9	Pembroke	.2	20
292	1.4	Marshfield	.6	67
156	0.7	Duxbury	.2	20
40	0.2	Halifax	0.0	0
60	0.3	Avon	0.0	0
123	0.6	Bridgewater	.7	79
927	4.4	Others***	4.3	481
21,068	100.0%	Total	100.0%***	11.092

* The projected percentages reflect forecasts assuming a six station transit extension. The surveyed percentages are for the actual three station extension.

** The Quincy figure includes 165 "reverse riders" because the projections treated the return trip origin (Quincy) as the trip origin.

***Others include E. Bridgewater, Canton, Milton, Foxboro, Norwood, Easton, Stoughton.

centages recorded for the outlying suburbs, can be related to the fact that the Extension to date has not penetrated the transportation corridor as originally intended. This would be especially valid for towns like Randolph and Brockton where significant percentages of the riders were expected to originate.

The lack of easy highway access due to the location of the terminal station at Quincy Center has reduced the effective service area of the South Shore Extension. The actual amount of Quincy boardings is less than the original projections and is due primarily to the fact that Quincy Center is operating as a regional terminal station. This tends to allocate parking facilities originally intended for Quincy residents to other South Shore residents.

Table III-2 describes the 1966 projected ridership for a six station extension to Weymouth (from page IV-10 of the Staff Supplementary Report).

Table III-2

Projected Ridership

Stations	AM Peak Hr. Inbd. Brdgs.	24-Hr. Inbd. Boardings	24-Hr.Autos Parked	Parking Lot Capacity
North Quincy	1500	4200	1200	1200
Wollaston	1300	3300	700	700
Quincy Center	1400	3500	500	500
Subtotal	4200	11000	2400	2400

	AM Peak Hr. Inbd. Brdgs.	24-Hr. Inbd. Boardings	24-Hr Autos Parked	Parking Lot Capacity
No. Braintree	1300	2900	1600	1500
So. Braintree	1500	3300	1700	1500
Subtotal	2800	6200	3300	3000
Weymouth	2600	5900	4100	4000
Grand Totals	9600	23100	9800	9400

A comparison of the actual ridership of the three existing stations is not completely valid since the above projections were made assuming a six station extension. MBTA fare collection records, from September 1971 to April 1973 indicate a range of average daily two-way passengers from 18,740 to 23,237 (the higher volumes being the latest). During the survey period (April 1972), the average daily two-way ridership was 19,820. It could be concluded that approximately 50% is inbound and that this figure, 9910, is about 9% lower than the projected subtotal for the existing three stations (11,000) from Table III-2. This conclusion, however, is not considered to be completely valid due primarily to the lack of good access to the existing three stations.

On March 20, 1973, the MBTA prepared a "Summary of Project Evaluation Report and Draft Environmental Impact Analysis for the Extension of the South Shore Rapid Transit Line from Quincy Center to South Quincy and South Braintree" as a part of the UMTA capital facilities grant application for further federal construction and engineering funds. On page 9 of this "Summary", the MBTA provided current ridership projections as shown in Table III-3.

Table III-3

Current MBTA Inbound Ridership Projections

(Made in 1973)

Station	Existing	I South Quincy	II North Braintree	III South Quincy And South Braintree	IV South Braintree
North Quincy	2,000	1,900	1,900	1,900	1,900
Wollaston	2,200	2,000	2,000	2,000	2,000
Quincy Center	7,800	6,000	6,000	5,600	6,000
South Quincy		5,400		3,900	
North Braintree			5,400		
South Braintree				4,400	5,400
Total:	12,000	15,300	15,300	17,800	15,300

These projections indicate a net increase in ridership of 5,800 inbound trips by providing two additional stations under Alternate III. This compares favorably with previous projections as shown in Table III-4. Table III-4 indicates that the stations at major arterial highways are essential in serving the widest range of transit markets. The current lower projections at the North Quincy and Wollaston Stations are due in part to the actual provision of fewer parking spaces at those stations than originally (1966) contemplated.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Table III-4

Comparison of Inbound Ridership Projections

Station	1966 Projections 24 Hr. Boardings	1966 Projections Parking Lot Capacity	1972 Projections 24 Hr. Boardings	1972 Projections Parking Lot Capacity
N. Quincy	4200	1200	1900	1000
Wollaston	3300	700	2000	500
Quincy Ctr.	3500	500	5600	850
N.B. or S.Q.	2900	1500	3900	1750
South Braintree	3300	1500	4400	1200
Totals	17,200	5,400	17,800	5,300

A comparison of the actual inbound ridership on the Quincy Extension versus the ridership on the Harvard-Ashmont line was made and is shown in Table III-5. This table lists the actual one-day turnstyle counts made in the first week of December for the years 1970, 1971 and 1972. The data is aggregated into several groupings of stations as follows:

Group A - North Quincy, Wollaston, Quincy Center

Group B - Ashmont, Shawmut, Fields Corner, Savin Hill, Columbia

Group C - Sum of Groups A and B

Group D - Harvard, Central, Kendall, Charles, South Station Broadway, Andrew

Group E - Sum of Groups A,B, and D or total Red Line less Park and Washington Stations

Group F - Park, Washington

Table III-5

Total Red Line Turnstyle Counts
(Daily Entering Passengers)

Group	Stations	Turnstyle Counts 1970	Turnstyle Counts 1971	Turnstyle Counts 1972	% Change 1970-1971	% Change 1970-1972
A	North Quincy, Wollaston Quincy Center	---	12,600	14,200	---	---
B	Ashmont, Shawmut, Fields Corner, Savin Hill, Columbia	38,100	32,500	29,900	-14.8	-21.6
C	Sum of Groups A and B	38,100	45,100	44,100	+18.3	+15.6
D	Harvard, Central, Kendall, Charles, South Station, Broadway, Andrew	62,900	64,400	65,400	+ 2.4	+ 5.5
E	Sum of Groups A,B and D or Red Line less Park & Washington	101,000	109,500	109,400	+ 8.4	+ 8.3
F	Park, Washington	75,300	78,000	65,600	+ 3.7	-12.8
G	Sum of Groups A,B,D & F or Entire Red Line	176,300	187,500	176,000	+ 6.4	Neg.

Notes: Turnstyle counts made by MBTA during first week of December of each year. Counts rounded to the nearest hundred.

The turnstyle counts for 1970, the last year before the opening of the South Shore Extension, were used as the base for comparing turnstyle counts for 1971 and 1972.

Group A (South Shore Stations) indicate turnstyle counts of 12,600 for 1971 and 14,200 for 1972. These counts, however, must be viewed in the context of the Group B stations which are in partial competition with the Group A stations. The Group B stations (Ashmont, Shawmut, Fields Corner, Savin Hill, Columbia) showed a total count of 38,100 in 1970. These volumes were reduced to 32,500 in 1971 and 29,900 in 1972 or by 14.8% and 21.6% respectively from the base year of 1970. Considering, however, the sum totals of both Groups A and B (shown as Group C in Table III-5), the total turnstyle counts increase to 45,100 in 1971 and to 44,100 in 1972, or increases of 18.3% and 15.6% over the base year (1970) volume of 38,100.

Chapter V, Section D, Previous Mode of Access of this report, shows that approximately 52% of the current South Shore Extension Ridership were previous transit riders; i.e., 39% took a bus to MBTA stations and 13% drove to or were dropped off at MBTA stations. The great majority of these previous transit riders were undoubtedly diverted from the five stations of Group B since these five stations tended to serve South Shore riders in terms of parking, previous bus routes and proximity to the South Shore Service area.

The [illegible]

opening of the South Shore [illegible], were used as the base for estimating [illegible] County for 1971 and 1972.

[illegible] and [illegible] for 1971. [illegible] be viewed in the number of the Group [illegible] which are in direct competition with the Group A stations. The Group B stations ([illegible], Shawmut, Fields Corner, Savin Hill, Columbia) [illegible] a total [illegible] of [illegible] in 1970. These volumes were reduced to [illegible] in 1971 and 29,400 in 1972 [illegible] respectively from the base year of 1970. Considering, however, the [illegible] totals of both Group A and B (known as Group [illegible] in this study), the total [illegible] counts increased to 41,[illegible]00 in 1971 and to 4[illegible] in 1972, increases of [illegible] over the base year (1970) volume of 32,100.

Chapter V, Section D, Previous Mode of Access of this report, [illegible] that approximately 52% of the current [illegible] were previous transit riders; i.e., [illegible] a bus to MBTA stations and 19% [illegible] or were dropped off at MBTA stations. The [illegible] readily diverted from the [illegible] of Group B [illegible]

Approximately 50% of the South Shore Extension for 1971 and 1972 is 6,300 and 7,100 respectively. This corresponds well with the actual losses of 5,600 and 8.200 for the Group B stations. It appears that in the initial years of operation of the South Shore Extension, that approximately 50% of the ridership are diversions from the existing Red Line.

The Group D stations in Table III-5 consist of those stations from which ridership most likely was NOT diverted upon the opening of the South Shore Extension. These stations showed increases of 2.4% in 1971 and 5.5% in 1972 over the base year (1970).

The Group E Stations include all stations on the original Red Line plus the South Shore Extension but do NOT include the Downtown Boston Park and Washington interchange stations. Again the trend is toward a general increase in ridership; i.e., 8.4% in 1971 and 8.3% in 1972 over the base year (1970).

The Group F ridership data is for the Park and Washington Stations. This data shows a slight increase of 3.7% in 1971 but a dramatic decrease of 12.8% in 1972. These station counts include Green Line ridership (at Park) and Orange Line ridership (at Washington). The data is presented separately because the losses in ridership are most likely due to Orange and Green Line influences since the total of all other Red Line Stations (Group E) show increases.

Table III-6

MBTA System Turnstyle Counts
(Daily Entering Passengers)

Group	Line	Turnstyle Counts 1970	1971	1972	% Change 1970-1971	% Change 1970-1972
1	Blue Line (Except State, Government Center)	27,600	28,400	25,300	+2.9	-8.3
2	Orange Line (Except Washington, State, Haymarket & No. Sta.)	70,000	70,900	67,200	+1.3	-4.0
3	Green Line (Except Park, Government Center, Haymarket & No. Station)	114,000	112,900	109,500	-1.0	-4.0
4	Red Line (Except Park & Washington)	101,000	109,500	109,400	+8.4	8.3
5	Interchange Stations (Park, Washington, Government Center, State Haymarket & No. Sta.)	122,400	116,500	106,600	-4.8	-12.9
6	Total System	435,000	438,200	418,000	+0.7	-3.9

Notes: Turnstyle counts made by MBTA during first week of December of each year. Counts rounded to the nearest hundred.

Table III-6 displays the total MBTA System turnstyle Counts for the years 1970, 1971 and 1972. The interchange stations of Park, Washington, Government Center, State, Haymarket and North Station have been tabulated separately since it is not possible to allocate the counts at these stations to individual lines.

The 1971 data shows that the Blue and Orange Lines had minor increases, the Green Line had a minor decrease, the interchange stations decreased significantly and that only the Red Line had a significant increase. The 1972 data shows that all lines and interchange stations decreased dramatically and that only the Red Line managed to demonstrate a continued increase over the 1970 data. Both the Red Line as a whole and the South Shore Extension in particular are demonstrating the capacity to retain ridership. This data is presented only to show the Red Line's performance in respect to the other lines. The problems and issues of the other lines' performances are beyond the scope of this study.

Stations were planned and designed using mode of access projections for each station. Table III-7 displays the breakdown in mode of access from the 1966 projections compared to the survey results. The 1966 projections were for a six station extension to Weymouth with expressway access while the survey is only for a three station extension to Quincy Center without expressway access.

Table III-7

Projected Mode of Access vs. Surveyed Mode Of Access

	Projected Percentage	Projected number	Survey Percentage	Survey Number (expanded)
Park & Ride	48	10,100	33	3,700
Kiss & Ride	17	3,600	16	1,800
Bus	26	6,000	16	1,800
Walk	8	1,700	32	3,600
Others	2	400	3	300
Totals	100	21,800	100	11,200

As illustrated in the table above, the projected percentages anticipated a transit extension where almost half of the riders arrived at the station by car, and where feeder buses played the next most significant role. The survey, however, indicates that walking to the station is almost as important a mode of access to the South Shore Extension as a car, while walking in the projected percentages provided the least significant percent of riders. Also, buses were anticipated to carry one quarter of the riders to the station, but the survey indicates they carry only 16%. The projected figures, however, were developed for a six station extension that extended into the suburban areas. The survey is a sample of only three stations all of which are in a city more densely populated than the average suburb, but less densely populated than other terminal areas such as Harvard, Lechmere or Forest Hills.

A station by station comparison of projected mode of access to surveyed mode of access further defines the reasons for the conflicting results, see table III-8.

Table III-8

Projected Mode of Access vs. Surveyed Mode of Access (by station)

(Percentages)

	Park Ride		Kiss Ride		Bus		Walk		Other	
	Proj.	Surv.	Proj.	Surv.	Proj.	Surv.	Proj.	Surv.	Proj.	Surv.
North Quincy	36	33	15	14	38	10	14	40	--	3
Wollaston	23	38	27	9	28	3	22	48	--	2
Quincy Center	8	35	16	22	63	25	10	16	3	2
Totals	26	33	17	16	41	16	16	32	0	3

Table III-8 indicates that the projected modes of access to the three Quincy Stations have not been substantiated by the survey. For example, Quincy Center was projected to receive almost two-thirds of its riders by bus. The survey indicates that only one-quarter arrive by bus. Walking was severely underestimated at all the stations as a mode of access. Also, Quincy Center was not intended as a primary park and ride station as it has been so far.

Thus, the three existing stations were designed as part of a six station extension, and as such, the special design characteristics (parking facilities, kiss-ride facilities, etc.) were also designed for these stations as part of a six station extension.

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[illegible]

[illegible]

This has resulted in some problems, the most notable is the inability of the present terminal station, Quincy Center, to provide adequate parking facilities. In turn, Quincy Center's inability to absorb the parking demands has led to overflow parking demands at Wollaston and North Quincy Stations.

If the present extension were extended to a five or six station facility, the modes of access to the stations may resemble more closely the projected figures. It is also suspected that the submodal projection techniques used for the South Shore projections tended to overstate the use of buses as a sub-mode and to understate the number of walk-ins. An extended South Shore extension with adequate access from major arterials would probably relieve the parking pressures from Quincy Center and would be able to service more suburban areas, where the car is the predominant mode of access to the station. The problems now confronting the three existing stations would probably diminish since the stations would be functioning in a manner that corresponds to the original design intent.

The problems relating to the fact that Quincy Center Station was not originally intended as the terminal station, notwithstanding, the South Shore Extension does exhibit mode of access characteristics that indicate it is serving a more suburban oriented ridership. Table III-9 compares mode of access characteristics of five terminal stations.

Table III-9

Comparison of Access Modes
Selected Transit Terminals

	Auto	Taxi	Walk	Bus	Other
Harvard	9	1	23	65	2
Wonderland	74	0	8	17	1
Forest Hills	29	1	9	61	0
Everett	11	0	3	84	2
Quincy Center	58	0	16	25	1

(Source: 1963 Transit Postcard Survey)
except for Quincy Center

Table III-9 clearly illustrates that Quincy Center is more automobile oriented than all terminals except Wonderland, which is unique with respect to its area location and its availability to large parking lots. Therefore, Table III-9 indicates that Quincy Center displays mode characteristics that indicate that it is a more suburban oriented station, as opposed to the other stations which illustrate characteristics which correspond to the urban areas that they serve. Wonderland displays characteristics of an even more suburban oriented station (relatively low densities).

CHAPTER IV

ENGINEERING DESIGN ASPECTS

This chapter is a descriptive account of some of the engineering aspects of the South Shore Extension. In no way does it attempt to analyze the impacts of the new engineering features. It is intended to widen the reader's understanding of the engineering aspects of the South Shore Extension and not to form conclusions as to the value of the engineering improvements.

The South Shore Extension, Figure IV-A, is a double track rail rapid transit line 6.25 miles long, running from a high speed flying junction with the Red Line near the subway portal at Dorchester Avenue in Boston to the Granite Street Bridge in Quincy, which is located about 1,000 feet south of the rapid transit station at Quincy Center. The extension runs along the roadbed of the former Old Colony Division of the New Haven Railroad.

The South Shore Extension was planned as a modern rail rapid transit facility. As such, it was designed and equipped with many special engineering features. For example, the cab signalling and train control systems include high frequency track circuits, system supervisory control, automatic train dispatching, automatic car identification and complete indication displays of track occupancy and safety interlocking of switches and signals. The motorman on the South Shore Extension can operate the train in two ways. The Automatic Train Control (ATC) is a manual mode of

operation. With ATC, the motorman regulates the speed of the train by application of power or braking. If, however, he exceeds the speed limit displayed on the digital read out, a warning beep will sound. The motorman must move the controller handle to the braking position within 2.5 seconds from the time of the warning or the overspeed control system will automatically stop the train.

The other mode of operation is Automatic Train Operation (ATO). This system is activated by the ATC switch and by advancing the controller handle to the maximum power position as the train is ready to leave the station. The train then automatically accelerates to the maximum permissable speed, accelerating and braking as required for subsequent speed limit changes indicated by the cab signals. By moving the handle from the maximum power position, the motorman can regain control for precise station stops or special situations.

The trackwork of the extension is an engineering design first for the MBTA system. It consists of 39 foot sections of 115-pound rail welded into quarter mile lengths and laid on concrete ties with rubber pads. The new approach to trackwork was intended to reduce noise levels, increase rider comfort, and reduce cost of maintenance.

The cars comprising the new line are also noteworthy additions to rail transit technology. The cars, built by Pullman-Standard, have an overall length of 69.5 feet and a seat-height width of 10 feet. Each car has seven grey-tinted laminated [illegible]tion. With ATC, the motorman regulates the speed of the train by application of power or braking. If, however, he exceeds the speed limit displayed on the digital read out, a warning beep will sound. The motorman must move the controller handle to the braking position within 2.[illegible] seconds from the time of the warning [illegible]

The other mode of operation is Automatic Train Operation (ATO). This system is activated by the ATO switch and by advancing the controller handle to the maximum power position as the train is ready to leave the station. The train then automatically accelerates to the maximum permissible speed, deceleration and braking is required for subsequent speed limit changes indicated by the cab signals. By moving the handle from the maximum power position, the motorman can regain control for precise station stops or special situations.

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The cars comprising the new line are also noteworthy additions to rail transit technology. The cars, built by [illegible]-[illegible], have an overall length of 6[illegible].5 feet and a seat-height width of [illegible] safety glass windows, and three doors per side. The car bodies are brushed aluminum with a high strength steel underframe. The top speed is 70 MPH with an acceleration rate of 2½ miles per hour per second. The cars have transverse fully upholstered seating for 64 passengers and have a maximum passenger load of 239. Each car is equipped with heating, air conditioning, a public address system and two-way radio communications. The cars also contain two rows of flourescent lights with shielded source diffusers to control brightness and glare.

As stated, the trackwork and cars were designed to significantly reduce the noise impact on the community and riders. An MBTA study on June 7, 1973, indicated that this goal has been achieved. At cruising speed, the in-car noise level of the new trains is 7 to 13 dBA lower than older cars on the same sections of subway, and as much as a 17 dBA difference occurs when new cars on welded track are compared with old cars on jointed track.

The alignment of the extension necessitated many new structures. The items discussed below are worthy of special notice because of their uniqueness and design.

The flying junction located at the tunnel portal before Andrew Station is a high speed rail interchange between the South Shore and the Harvard-Ashmont Line. It is constructed primarily of concrete and consists of an underpass for outbound South Shore trains which tunnels under the Harvard-Ashmont tracks, and an overpass (on which both lines merge)

for inbound Harvard-Ashmont and South Shore trains. The overpass crosses over the tunnel section.

The Savin Hill flyover is a 950-foot elevated structure located near the Savin Hill Station of the Red Line. It consists of a cast-in-place concrete deck on girders of weathering steel. The flyover carries South Shore Extension cars across a Penn-Central Freight track which was relocated to the west side of the new route.

The George L. Anderson Bridge is another structure of note on the South Shore Extension. It replaced the fire-damaged Neponset River railroad bridge. It runs for 1,185 feet between abutments and spans a total distance of 3,000 feet including approaches. The bridge has two tracks, and carries rapid transit trains exclusively. The deck of the Anderson Bridge consists of a cast-in-place deck on weathering steel girders.

The three stations which comprise the new extension also are the product of new and innovative engineering and architectural design aspects.

North Quincy Station, Figure IV-B, is located at Hancock Street. It is approximately midway between the former Atlantic and Norfolk Downs Railroad Station. Construction is primarily of precast concrete members with some cast-in-place reinforced concrete. Interior walls of the lobbies are finished with glazed brick.

for inbound Harvard-Ashmont and South Shore trains. The overpass crosses over the tunnel section.

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[illegible] and [illegible]. This prop- [illegible] [illegible].

The Savin Hill Flyover is a [illegible] structure located near the Savin Hill station of the Red Line. It consists of a cast-in-place concrete deck on girders of weathering steel. The flyover carries South Shore Extension over a Penn Central freight track which was relocated to the [illegible] side of the [illegible] north.

The [illegible] is [illegible] on the Upper [illegible]. It replaced the [illegible] Neponset River railroad bridge. It runs for 1,165 feet between abutments and spans a total distance of 1,000 feet including construction. The bridge has two tracks, and carries [illegible] transit traffic exclusively. The deck of the bridge consists of a cast-in-place deck on weathering steel girders.

The three structures which comprise the new construction are all the product of new and innovative engineering [illegible] [illegible].

North Quincy Station, Figure IV-3, is located at Hancock Street. It is approximately midway between the former Wollaston and Norfolk Downs Railroad Stations. Construction is [illegible] of [illegible] with [illegible] concrete. Interior walls of the lobbies are finished with glazed brick.

The station has North and South lobbies with stairs and escalators serving a single "island" platform between the tracks. The South Lobby is located on West Squantum Street and is connected to a bus transfer area that has a shelter equipped with heated benches. This lobby also serves pedestrians from West Squantum Street and the southerly end of a 600-car parking lot. The North Lobby, off Hancock Street, serves the remainder of the parking lot as well as pedestrian traffic from Hancock Street. It also serves a kiss and ride area that has a capacity for 41 cars. In the future, approximately 400 parking spaces will be added on the west side of the station. The North Lobby has begun to serve the new business and residential complex under development on the west side of the tracks. The train platform is equipped with windbreaks that have electrically heated benches to insure passenger comfort in inclement or cold weather.

North Quincy Station was one of four architectural projects selected by the New England Regional Council of the American Institute of Architects for an Honor Award.

Wollaston Station, Figure IV-C, is located near the former Wollaston Railroad station at Beale Street. Construction is of cast-in-place reinforced concrete. Passenger platforms, located above the station lobby, have an overhead concrete canopy and are equipped with windbreaks and heated benches. The station lobby is located beneath the tracks. It is enclosed by large glass doors and its interior walls are faced with attractive polished

granite. There are stairs and escalator for access to the island platform serving the trains.

Pedestrian access to the station lobby is from Woodbine Street on the east side; from Newport Avenue, opposite Brook Street, on the west side; and via a walkway from Beale Street on the south side. Automobiles enter and leave a 500-car parking lot from Woodbine Street. Buses do not enter the station area, but stops are provided on Newport Avenue and Beale Street near a walkway, adjacent to which is a bus waiting area with benches. Like the bus passengers, kiss and ride passengers also enter the station from Newport Avenue and Beale Street, both of which have been reconstructed to five lanes, with the new fifth lane reserved for drop-offs.

Quincy Center Station and Garage, Figure IV-D, is located near the old Quincy railroad station, between Hancock Street and Upland Road. Construction of the station and the five level electronically monitored parking garage over the tracks is of cast-in-place reinforced concrete. The station lobby is at ground level and has space for commercial shops. Stairs and escalators lead down to the train platform. There are also elevators to the lobby from the upper levels of the 850-car parking garage.

Pedestrian access to the lobby is via a pedestrian mall from Hancock Street and from Upland Road. Automobile access to the garage is via separate lanes from both Hancock Street and Upland

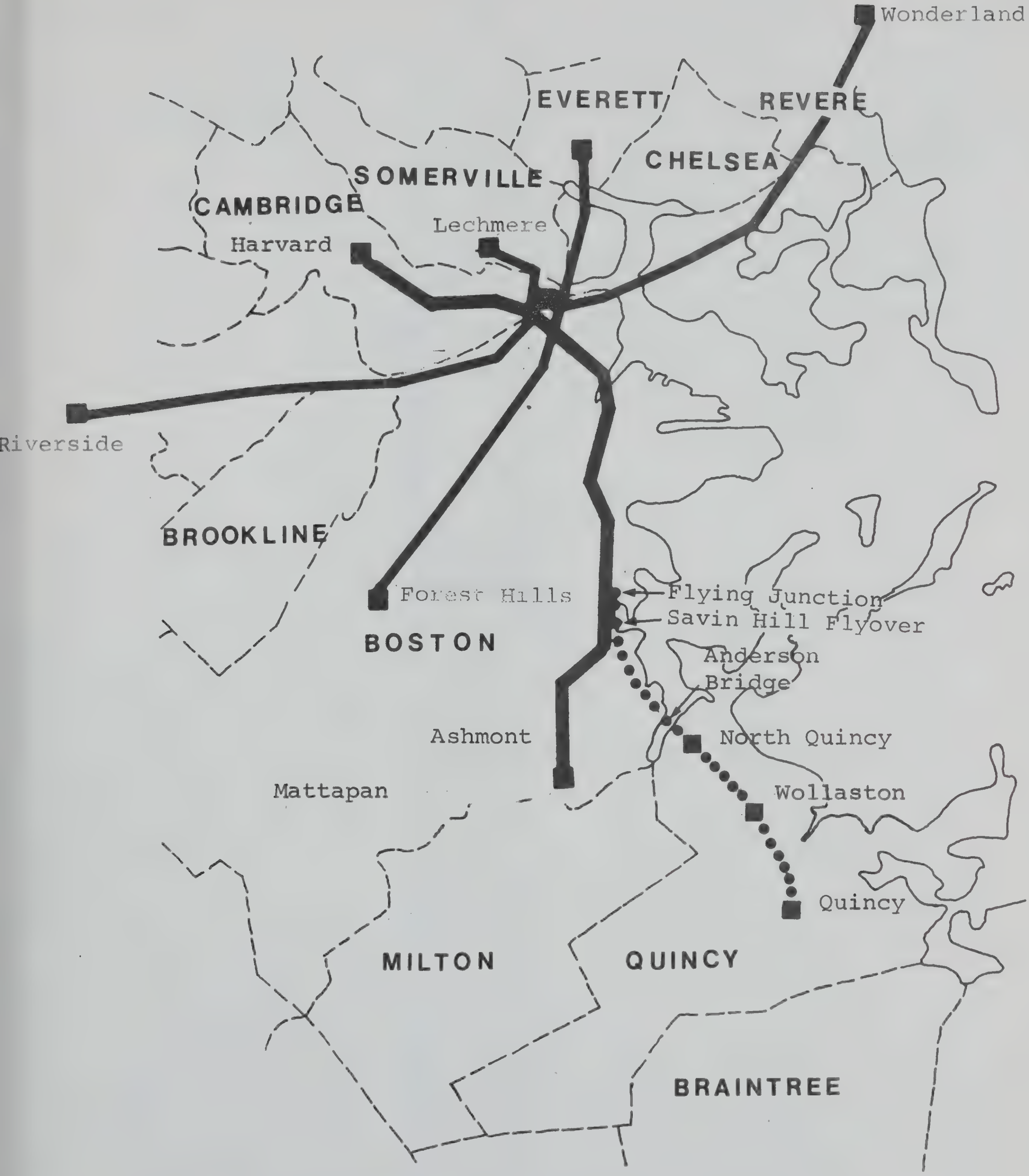
Road. Cars leave the garage, which has a drum-shaped high speed ramp, only via Upland Road.

An entry lane from Hancock Street runs to the east side of the station which has an exclusive busway with a large concrete canopy for the protection of arriving and departing bus passengers. Kiss and ride passengers enter from Hancock Street. This short term facility has a capacity of 54 cars.

The South Shore Extension has many new engineering and architectural features which are serving as a model for further construction projects planned by the MBTA.

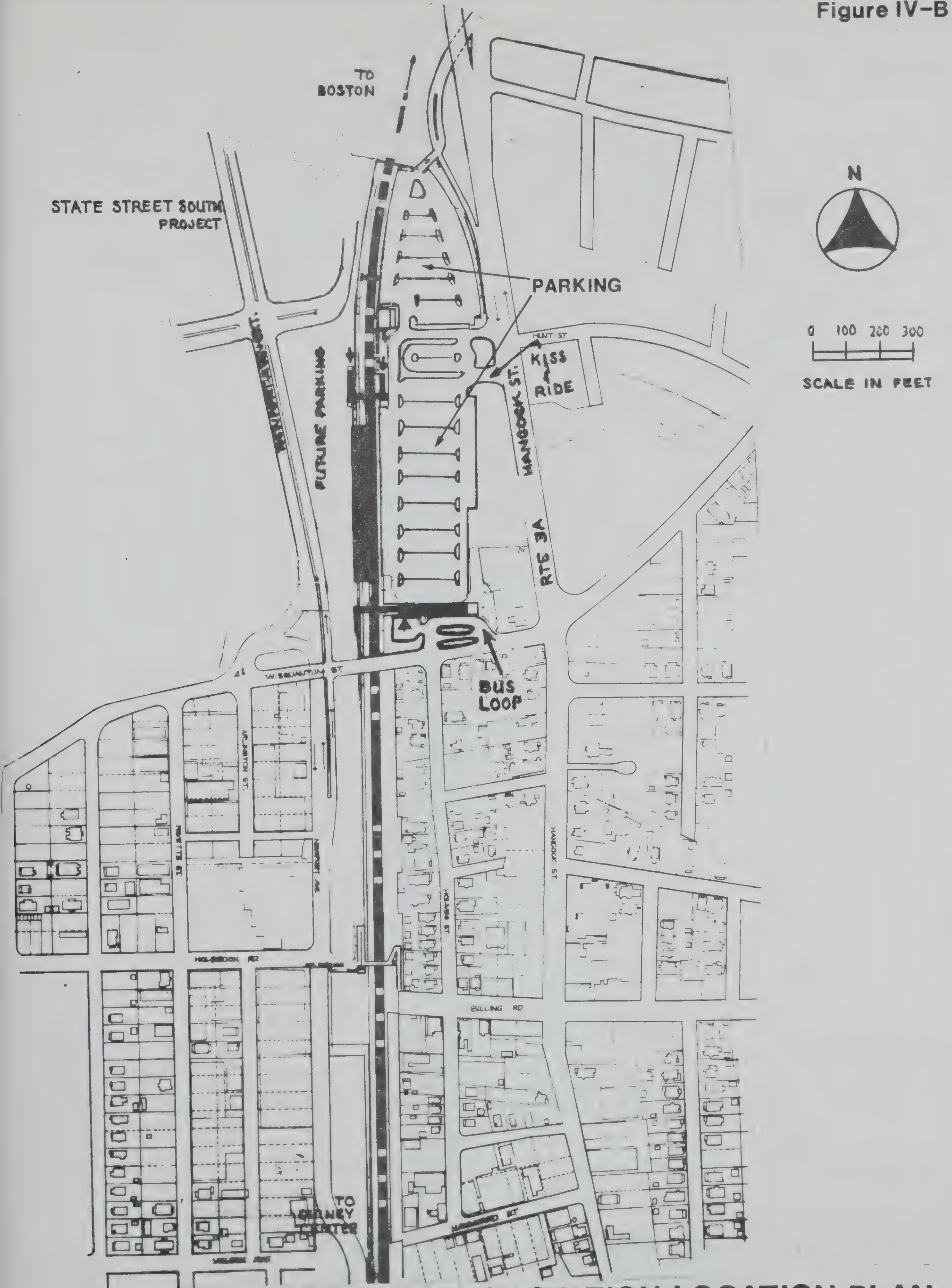
Figure IV-A

SOUTH SHORE EXTENSION


Wonderland
EVERETT
REVERE
CHELSEA
SOMERVILLE
CAMBRIDGE
Harvard
Lechmere
Riverside
BROOKLINE
Forest Hills
BOSTON
Flying Junction
Savin Hill Flyover
Anderson Bridge
North Quincy
Ashmont
Mattapan
Wollaston
Quincy
MILTON
QUINCY
BRAINTREE
Red Line
●●●● South Shore Extension

MBTA - MAPC Survey
South Shore Transit Line
April, 1972

Figure IV–B


TO
BOSTON
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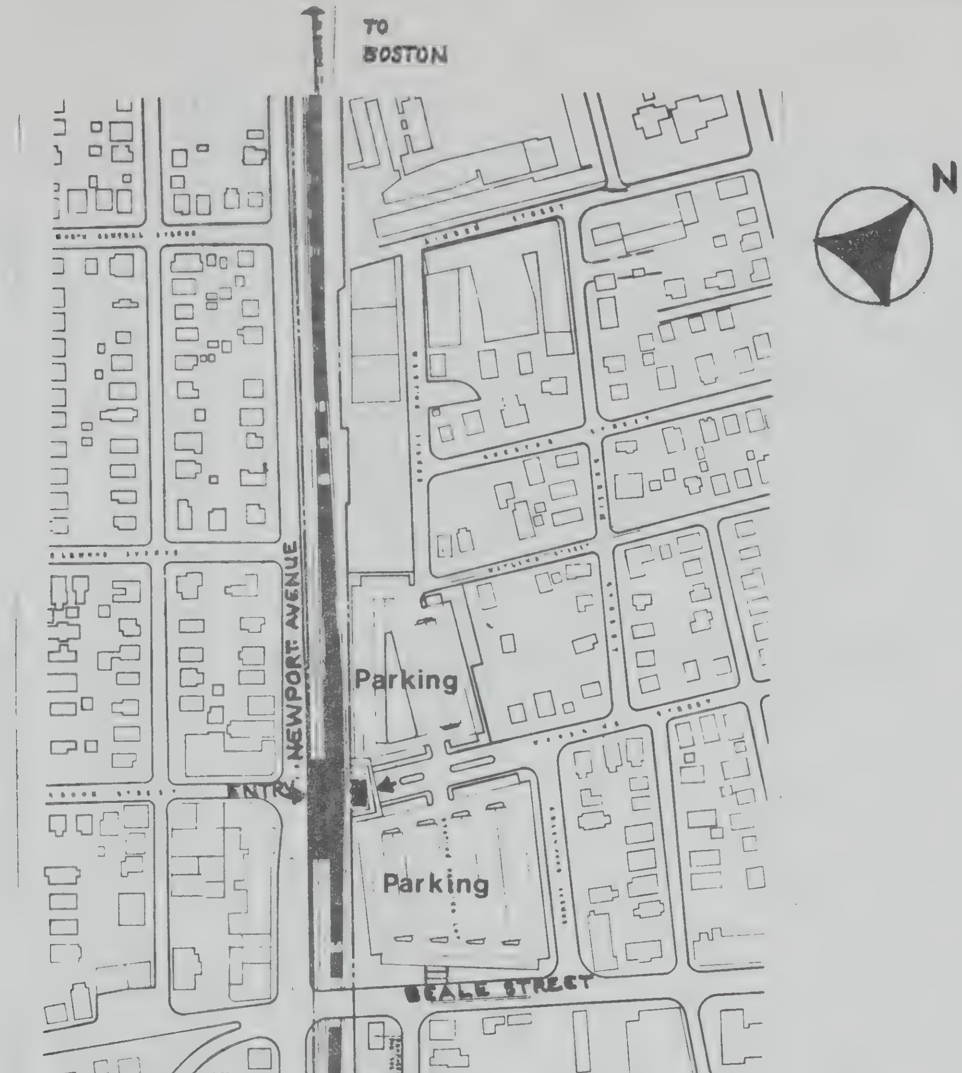
BUS
LOOP
ARLINGTON ST.
HANCOCK ST.
HOLMES ST.
HOLBROOK RD.
BILLING RD
TO
QUINCY
CENTER

NORTH QUINCY STATION LOCATION PLAN

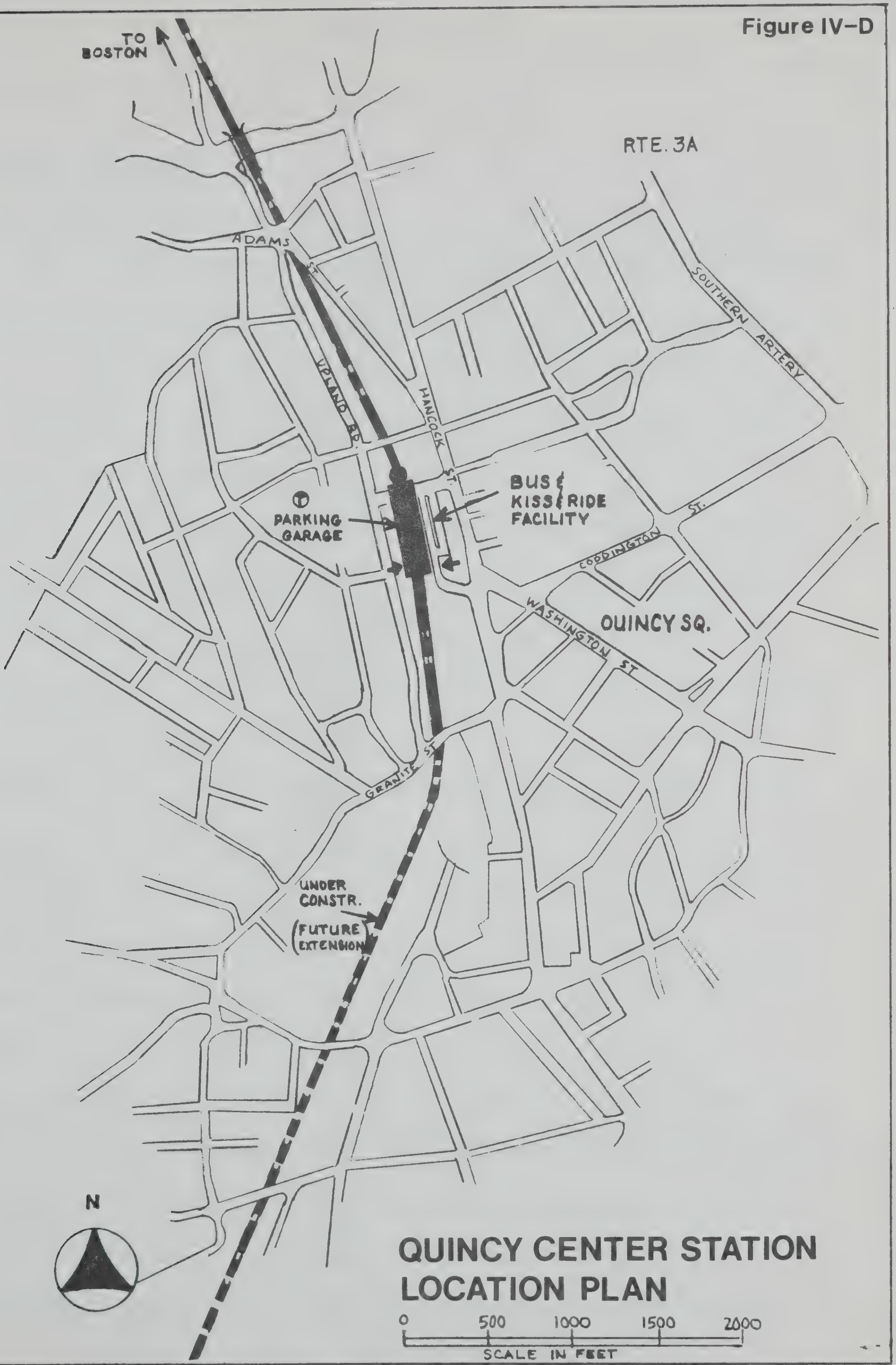
Figure IV-C


TO BOSTON
N
NEWPORT AVENUE
Parking
ENTRY
Parking
BEALE STREET
TO QUINCY CENTER

WOLLASTON STATION LOCATION PLAN

0 100 200 300
SCALE IN FEET

Figure IV–D



TO BOSTON
RTE. 3A
ADAMS ST
SOUTHERN ARTERY
UPLAND RD
HANCOCK ST.
BUS & KISS & RIDE FACILITY
PARKING GARAGE
COODINGTON ST.
WASHINGTON ST
QUINCY SQ.
GRANITE ST
UNDER CONSTR.
(FUTURE EXTENSION)
N
0
500
1000
1500
2000
SCALE IN FEET

QUINCY CENTER STATION LOCATION PLAN

CHAPTER V

RIDERSHIP CHARACTERISTICS

Demographic Summary

The South Shore area, as defined for the purposes of this study, encompasses an area of 253 square miles bounded on the north by the Neponset River and Massachusetts Bay and on the east by the Atlantic Ocean. The western and southern boundaries of the area extend to and include the Townships of Milton, Randolph, Holbrook, Rockland, Hanover, Pembroke and Duxbury.

The area includes sixteen cities and towns, four of which each have a population of over 25,000. These four communities are Quincy, Weymouth, Braintree, and Milton and they constitute most of the area lying closest to downtown Boston. The total population of the area is 302,164 with an average density of 1300 persons per square mile. The greatest population density is in Quincy with 5294 persons per square mile and the least is in Duxbury with 194 persons per square mile. Several areas of low population density are formed by U. S. Naval Reservations in Cohasset, Hingham, and Weymouth, together with the Blue Hills Reservation in Quincy and Milton.

Manufacturing employment is concentrated in Quincy with 16,000 jobs and in Braintree with 3700 jobs. This total of 19,700 compares to the total of 7,000 similarly employed in the other fourteen townships. The major industries in the South Shore area consist mainly of wholesale and retail trade, construction and service

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

industries.

The most important highway facility in the South Shore area is the Southeast Expressway which runs diagonally through the center of the area from the southeast corner to the northwest corner and crosses the Neponset River just north of the center of Quincy. Expressway service is provided west of the Southeast Expressway by Route 128 which runs from a point near the north edge of Braintree, westerly and then northerly around the periphery of the Boston metropolitan area. Route 24 runs along the westerly edge of the South Shore area, as defined herein, and connects with Route 128 and the Southeast Expressway. There are numerous other roads and lesser highways in the area generally providing relatively acceptable service during off-peak periods. During the morning and evening rush periods, however, many of these highways, particularly in the areas of Quincy, Braintree, and Weymouth, are congested.

A. TIME OF USE

During the day of the ridership survey, turnstyle counts were made of the TOTAL ENTERING riders at each station. Table V-1 displays this data together with the actual number of survey questionnaires that were RETURNED. The data indicates that, for both the total survey time (5:00 AM to 2:00 PM) and for the peak period (7:00 AM to 9:00 AM), the percentage of survey questionnaires returned versus the turnstyle counts ranges from 44% to 63% for any or all stations. The percentage of responses for the non-peak periods were always lower than those for either the peak period or the total survey hours, and range from 13% to 43%.

Turnstyle counts indicate that 55% of the ridership entered the transit extension at Quincy Center Station, while 26% entered at Wollaston Station and 19% at North Quincy Station. The survey responses indicated that the percent returns were 53% for Quincy Center, 26% for Wollaston and 21% for North Quincy. The survey response percentages on an individual station basis were nearly identical to the percentages of the actual ridership.

Considering the very large sample during the survey hours and the data's consistency with known socio-economic characteristics, it was decided that an expansion of the data to reflect total daily inbound ridership would be a valid representation of ridership characteristics and impacts. (This decision is also discussed in Chapter III.) Therefore, all tables and figures which display survey data represent total daily ridership.

Table V-1

Comparison of Turnstyle Counts and Survey Returns

	N. Quincy			Wollaston			Quincy Ctr.			All Stations		
	S	T	%S÷T	S	T	%S÷T	S	T	%S÷T	S	T	%S÷T
5:00- 7:00	59	160	36	60	229	26	175	403	43	294	792	37
7:00- 8:00	261	424	61	295	583	50	884	1628	54	1440	2635	54
8:00- 9:00	305	474	63	447	806	55	632	1210	52	1384	2590	55
9:00-10:00	62	140	43	66	193	34	124	288	43	252	621	40
10:00- Noon	77	220	35	74	212	35	153	476	31	304	908	33
Noon- 2:00	44	145	28	38	147	23	75	507	13	157	799	18
Totals for Survey Hrs.	808	1563	51	980	2170	44	2043	4512	45	3831	8245	46
Totals Non-Surv. Hrs. 2pm-1am	0	883	0	0	449	0	0	1635	0	0	2847	0
Totals all hrs.	808	2446	NA	980	2619	NA	2043	6147	NA	3831	11092	NA
Peak Period 7:00- 9:00	566	898	63	739	1389	53	1515	2838	53	2814	5125	54

S = Survey Response
T = Turnstyle Counts

Figure V-A illustrates that 47% of the riders surveyed entered the transit extension stations between the hours of 7:00 AM and 9:00 AM. Before and after this period, the percent of entering riders by hour is substantially lower. Therefore, for inbound entering ridership, the peak hours of user demand can be identified as between 7:00 AM and 9:00 AM. Also, the remaining hours have a uniformly low percentage of daily ridership, indicating that, after the morning peak period, there is no other time of relatively high user demand for inbound transit.

Figure V-B is comprised of three bar graphs that illustrate time of use patterns for each station in the transit extension. This figure indicates that the time of use percentage patterns for the individual stations do not differ significantly from each other, or the aggregate time of use percentage pattern displayed in Figure V-A. All stations experience entering peak hour demands from 7:00 AM to 9:00 AM and all stations accommodate the large majority of their inbound riders in the morning (50% - 77%), indicating that inbound demand in the afternoon and evening is low. The only important variation occurs at North Quincy Station from 2:00 PM to 3:00 PM. During this hour, entering ridership increases significantly for a non-peak hour period (i.e.) 8% up from 5% the previous hour, and followed by 3% from 3:00 PM to 4:00 PM. The increase is directly attributable to North Quincy High School, which is adjacent to the transit station, and ends its school day between the hours of 2:00 PM and 3:00 PM. Ridership data

[illegible]

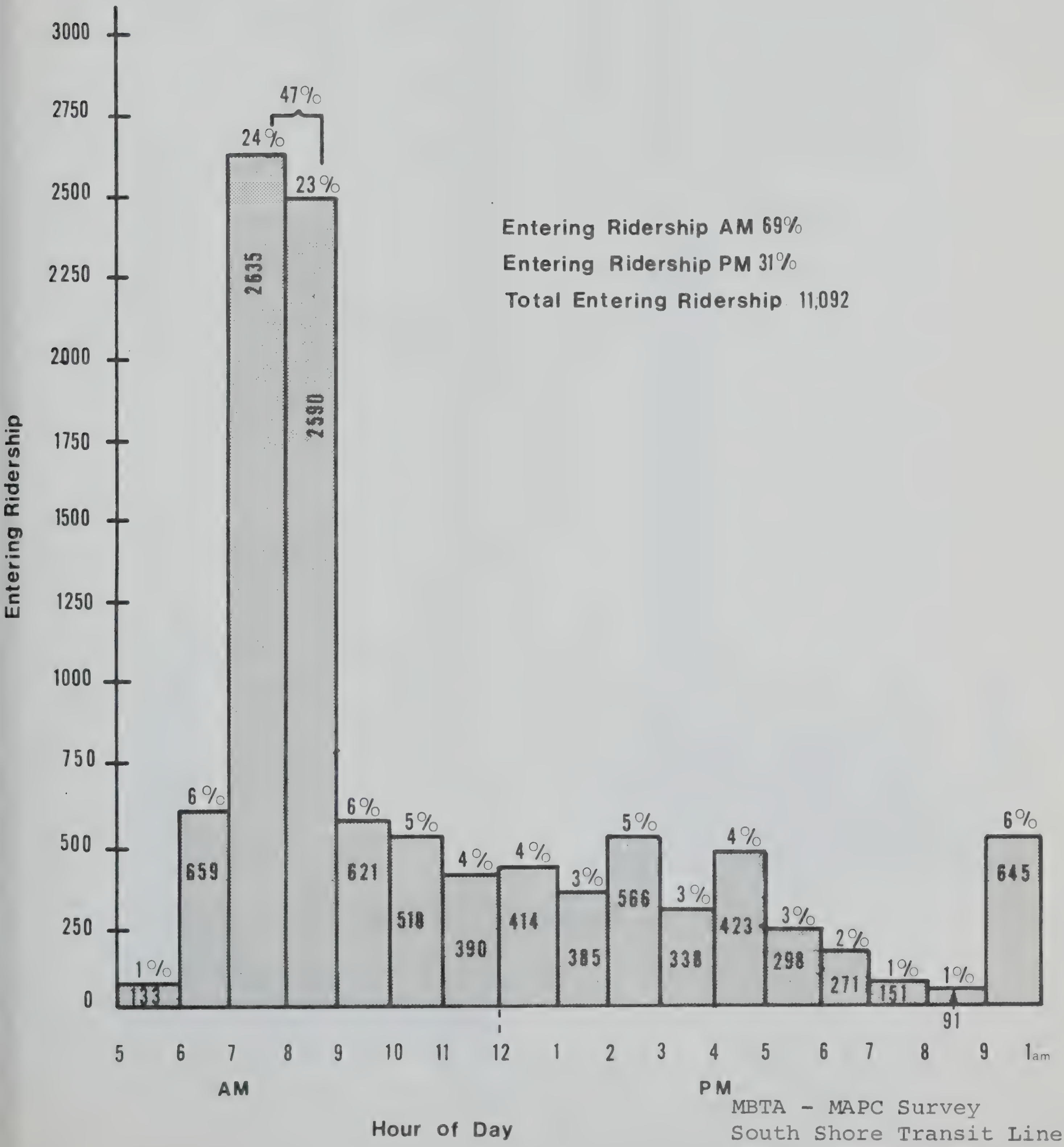
[illegible]

[illegible]

Figure V – A

ENTERING RIDERSHIP BY HOUR OF DAY (April 27, 1972)

(Turnstyle Counts At All Stations)



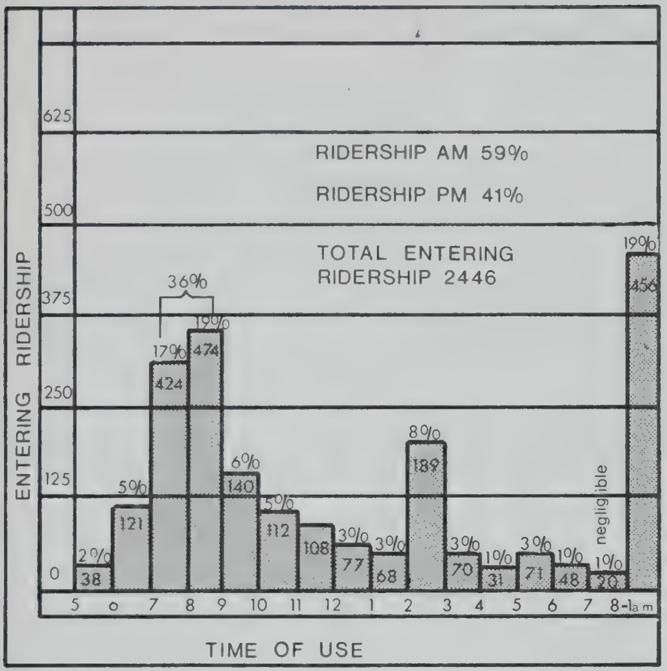
MBTA - MAPC Survey
South Shore Transit Line
April, 1972

Figure V–B

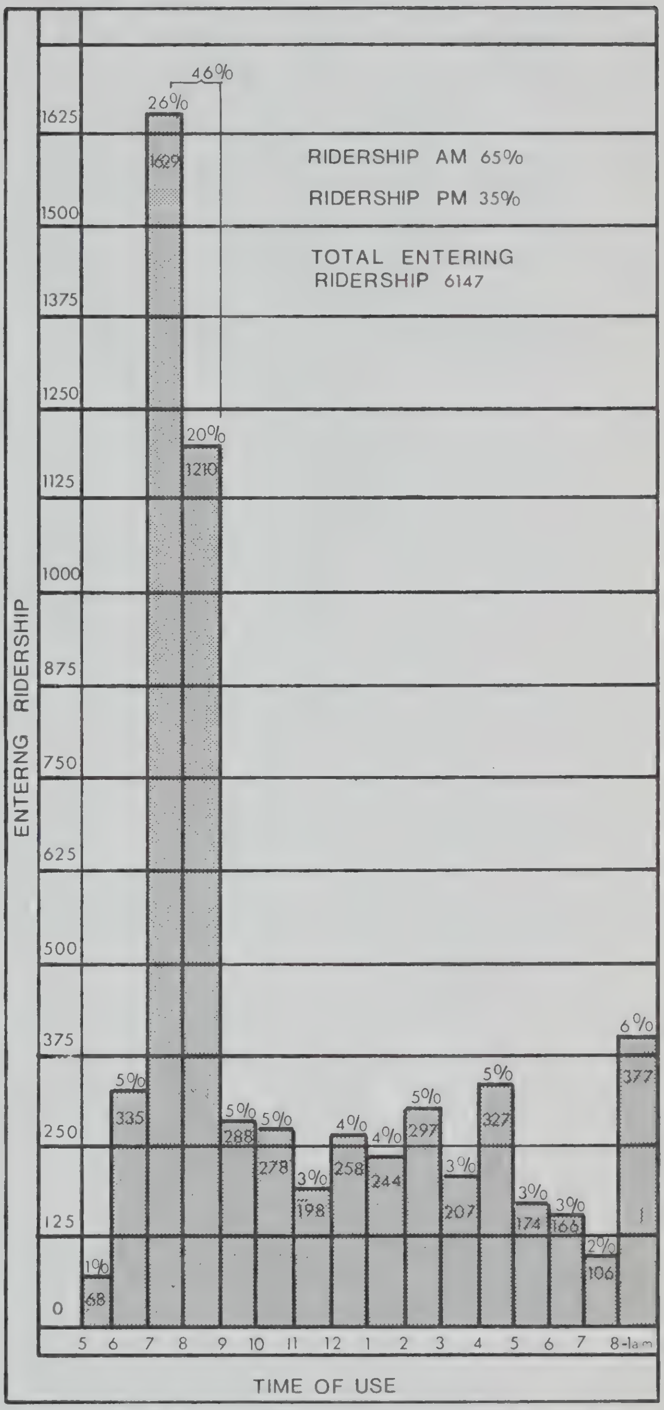
ENTERING RIDERSHIP BY HOUR OF DAY (April 27,1972)

(Turnstyle Counts, Individual Stations)

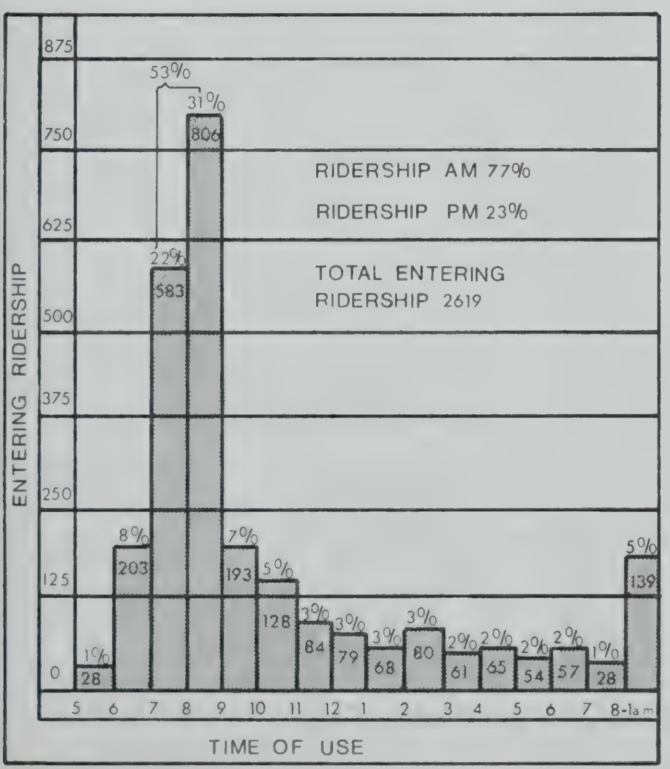
NORTH QUINCY



QUINCY CENTER



WOLLASTON



MBTA - MAPC Survey
South Shore Transit Line
April 1972

is available for all stations for the peak 15 and 20 minute periods, if desired.

It should be noted, that during the final stages of this study, a new banking complex, State Street South, was officially opened. The new complex is adjacent to North Quincy Station. While State Street South is not expected to alter the time of use characteristics of the transit station, it is expected to increase the daily ridership using the station. To date, studies comparing the April 27, 1972 survey day turnstyle counts to May 21, 1973 turnstyle counts (approximately one week after the opening of the banking complex) indicate that inbound ridership at North Quincy Station (entering at North Quincy Station, and going toward Boston) has increased 19%. Outbound ridership (entering north of the Quincy Stations and traveling to Quincy) has increased 38% for a total ridership increase at North Quincy of 28%. With further expansion of the banking complex (as planned) further increases in entering ridership can be expected.

B. PURPOSE OF TRIP

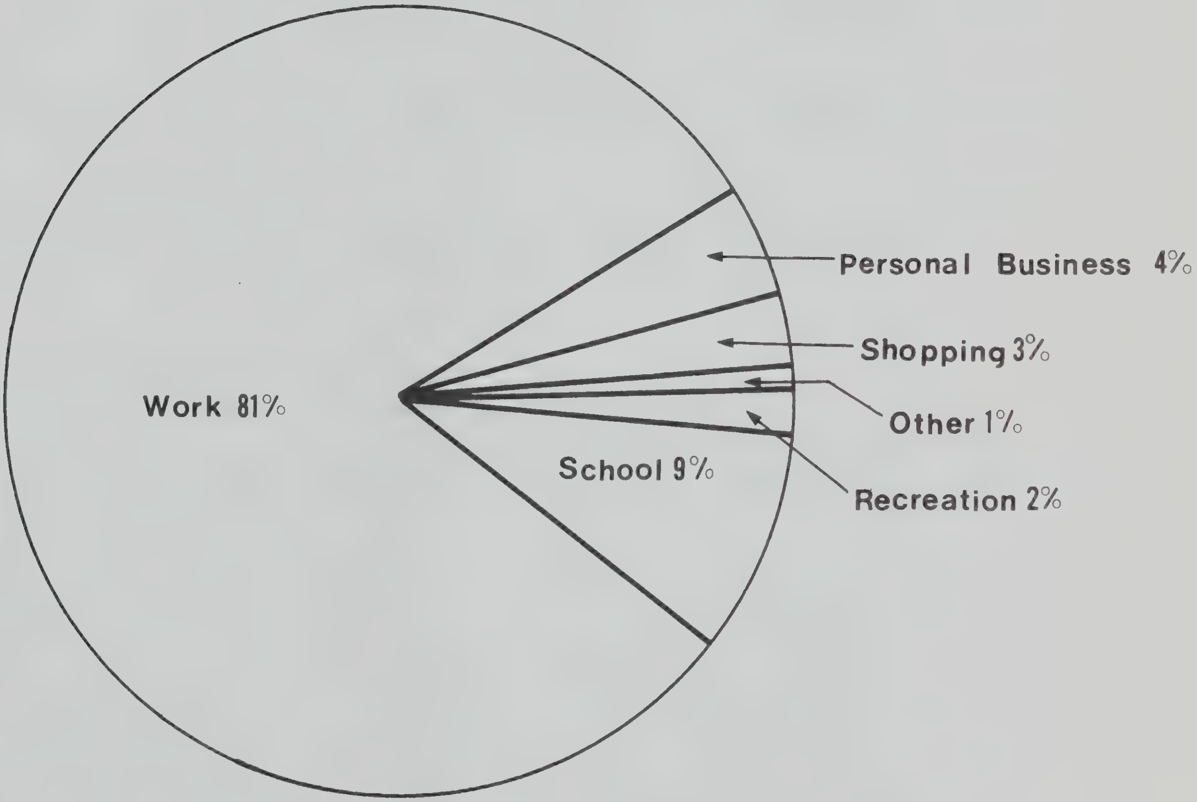
As shown on Figure V-C, there were five major categories of trip purposes indicated on the survey returns. Commuting to work is the purpose for the large majority of the transit trips, (81%). The use of transit for access to schools is a distant second with 9%. However, the percentage assigned to the school category is relatively high in comparison to the remaining categories, i.e., personal business, shopping and recreation. These percentages are essentially identical to the MBTA systemwide trip purpose percentages as documented in the 1965 Comprehensive Traffic and Transportation Inventory, thus indicating that, at least for trip purpose, that this extension exhibits qualities similar to those of the entire MBTA System.

As described in the section concerning time of use, the peak period of inbound ridership occurs between the hours of 7:00 - 9:00 A.M. Considering that most of the riders are commuting to work, it seems reasonable to assume that the peak period of use is directly related to the starting times of the riders who use the transit to commute to work.

The percentage of riders commuting to work is at least a plurality of the riders during any time period for all three stations combined and individually. However, after the peak period, work as a purpose of trip decreases significantly in terms of percentage; i.e., from 93% in the peak period to 36% in non-peak hours.

PURPOSE OF TRIP

(South Shore Transit Riders)



(All Day)

MBTA - MAPC Survey
South Shore Transit Line
April, 1972

The other purposes of use (school, recreation, personal and shopping) however, reach their peak during the off-peak hours. When non-work percentages are combined after 10 A.M., they comprise the majority of the ridership. Thus, non-work purposes for use, occur primarily during the off-peak hours, when they do not have to compete with the large number of workers using the system during the peak hours.

The purpose of trip data shows that most riders use the transit system to get to work. During the off-peak hours, however, most riders are not going to work but are using it for personal reasons, school and shopping. While time is a factor relating to purpose of use; age, income and mode of travel to station were found to be unrelated and to have no effect on the purpose for use.

Table V-2

Time of Use and Purpose of Trip

Purpose	5-7 a.m.	7-9 a.m.	9-10 a.m.	10-12 a.m.	12-2 p.m.
Work	93	91	62	37	36
School	2	7	14	21	17
Personal Business	1	1	8	19	23
Shopping	0	0	9	15	16
Recreation	0	0	5	6	5
Other	2	1	2	2	3
No Answer	2	0	0	0	0
% Totals	100%	100%	100%	100%	100%
Total Ridership 5 a.m. - 2 p.m.	792	5225	621	908	799

Table V-2 indicates that, during the peak hours of use (7:00 - 9:00 A.M.), more than 90% of the ridership is commuting to work, and approximately 7% are going to school, while insignificant

percentages of riders have other purposes for the trip. Thus, during the peak hours almost all riders are going to work or to school. However, after the peak period, work as a purpose for the trip, decreases significantly and the other categories experience substantial increases in percentage of hourly ridership and in real numbers.

C. REASONS FOR USE

Reasons for use are varied in that no one category completely dominates all others, as is the case with purpose of trip. Figure V-D displays the reasons given for utilizing the transit system in terms of an attitude analysis and in terms of a time-cost analysis.

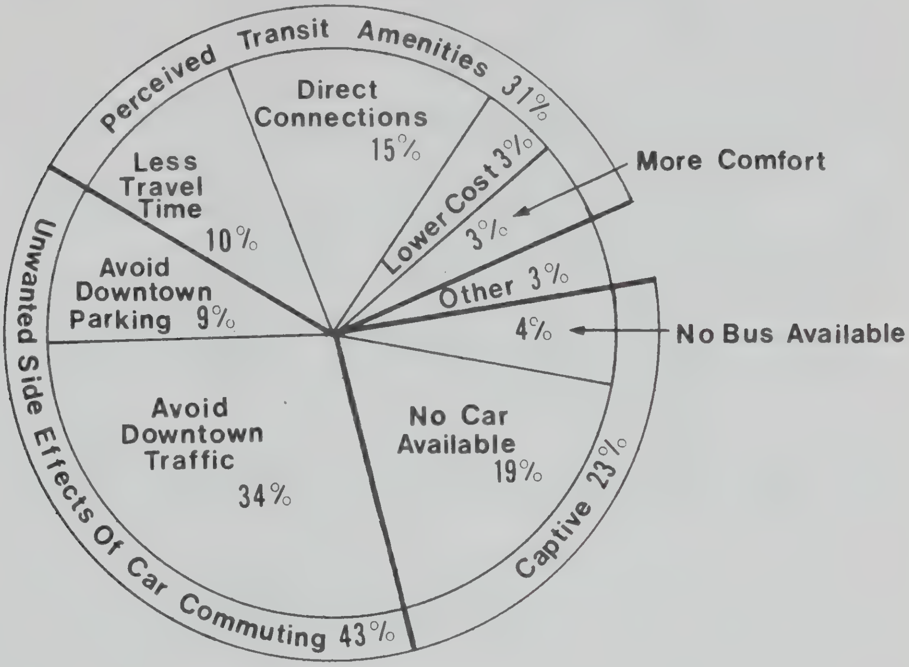
In general, the attitude data reveals that 43% of the riders used transit because of unwanted side effects of auto commuting, and conversely 31% chose transit because of perceived transit amenities. The remaining riders indicated that they had no other means of travel; i.e., for 4%, a bus was not easily accessible, and for 19%, no car was available. This indicates that more people are using the transit extension because of unwanted effects of auto commuting than because of perceived transit benefits. Figure V-D also shows that approximately three-fourths of the ridership is derived from non-transit dependent persons, indicating that the transit extension is attracting significant numbers of riders from other modes of transportation.

Figure V-D, therefore, indicates that the "captive market" (carless, aged, young, infirm, etc.) do not comprise a majority of the riders on the transit extension. Rather, by a ratio of approximately 3 to 1 the transit extension is attracting riders with alternate means of transportation, while still servig those with no other means of transportation. As will be discussed further in Section K of this chapter, the average rider on the

Figure V-D

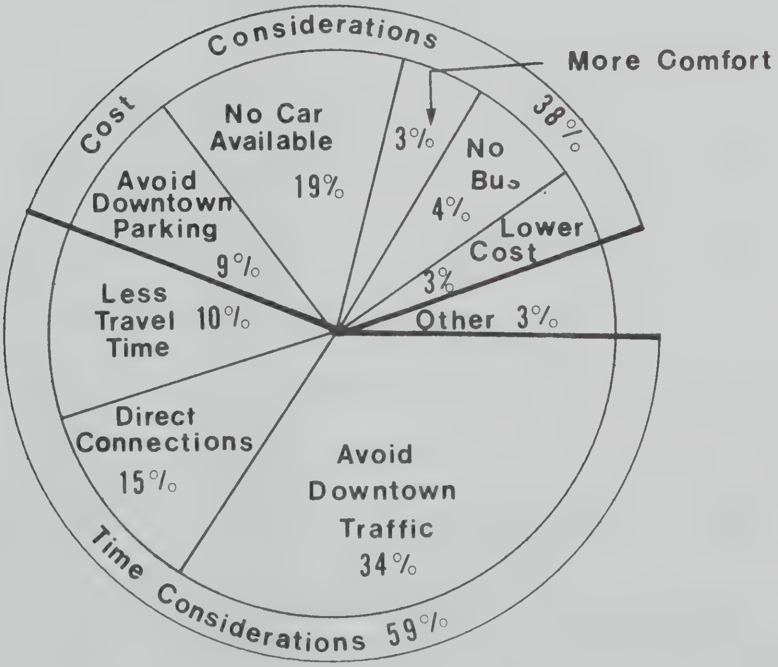
REASONS FOR USE
(South Shore Transit Riders)

ATTITUDES



(All Day)

TIME AND COST



(All Day)

MBTA - MAPC Survey
South Shore Transit Line
April, 1972

South Shore Extension has socio-economic characteristics that more closely resemble the "average resident" of the south shore than the characteristics of those in the captive market.

The reasons given for transit use (attitude analysis) were studied in relation to certain factors that could influence the reasons given for transit use. Avoiding downtown traffic was the major reason for use given by those using the transit system for commuting to work (trip purpose). This result is not unexpected since workers have relatively severe time constraints.

The lack of availability of buses (through buses to Boston) as a reason for use is not significant in any trip purpose category. The lack of availability of a car, while its significance varies according to purpose category, is a significant reason for use for all purpose categories. The lack of availability of a car is more important as a reason for use among the shopping, recreation and personal business transit users than among workers. This result is consistent with other data collected which indicates that people traveling to work have more access to cars than people using transit for other purposes.

Taking less time for the transit trip as a reason for use has about equal weight with all purposes of the trip categories. Direct connections, is an important reason for use in all purpose categories. However, it is most important for shopping, since bought goods must be carried. Comfort, as a reason for use, has a low response from most purpose of use categories. As a result, definite

relationships cannot be estimated.

It is significant that avoiding downtown parking as a reason for use, is more important to those on personal business, or going to school than it is for people going to work. The explanation apparently relates to the times when most people on personal business or going to school use the transit system; i.e., non-work purposes tend to utilize transit in off-peak hours when available parking tends to be at a minimum. Age and income of the riders varies greatly. However, the data collected, when cross tabulated with the reasons for use, does not reflect any significant relationship to the reason given for using the transit system.

Table V-3 displays Car Availability and Purpose of Trip and Table V-4 displays Reasons for Use and Purpose of Trip.

In summary, the reasons for use reflect a general desire to avoid perceived automobile commuting problems, more than they reflect a use of transit because of perceived benefits. The purpose of the trip has some influence on the reason why a person chooses transit. In general, this relationship shows that traffic problems and delays caused by car commuting are more important reasons for the commuting workers than for people using transit for non-work purposes.

Table V-3

Car Availability and Purpose of Trip

	Work	School	Personal	Shopping	Recreation	Other	Total Riders
Car	63%	49%	48%	43%	40%	51%	6,370
No Car	32%	46%	47%	50%	58%	33%	3,956
No Answer	5%	5%	5%	7%	12%	16%	666
Totals	100%	100%	100%	100%	100%	100%	11,092

Table V-4

Reasons for Use and Purpose of Trip

Reasons	Work	School	Personal Business	Shopping	Recreation	Other	No Answer
Avoid downtown traffic	38%	23%	23%	16%	23%	20%	13%
Avoid downtown parking	8	11	11	7	14	7	0
Subtotal (Unwanted auto side effects)	46	34	34	23	37	27	13
Less traffic time	10	7	7	9	7	16	13
Directly to destination	15	16	16	22	16	13	0
Lower Cost	3	1	1	3	1	0	7
More Comfort	3	6	3	1	5	2	7
Subtotal (Perceived transit amenities)	31	27	27	35	29	31	27
No car available	16	28	28	25	28	31	33
No bus available	3	3	5	8	3	4	7
Other	3	4	5	8	3	4	7
No answer	1	1	1	1	0	3	13
Totals	100%	100%	100%	100%	100%	100%	100%

Figure V-D also displays reasons for use in terms of time and cost. This was derived by regrouping all appropriate categories into either a time or cost category. The resulting figure indicates that the majority of the riders choose transit because of time considerations (59%) while cost considerations totaled 37%.

The fact that time considerations are in the majority is substantiated by the time of trip data gathered in the survey which indicated that riders from Quincy (the majority of the daily riders) had very significant time savings (36%) by using transit. The towns of Braintree and Weymouth (where a substantial percentage (20%) of the ridership originates) also indicated time savings over previous modes of travel.

In summary, time is the factor behind the majority of the reasons to utilize the transit extension. It indicates that the transit extension is perceived by the majority of riders as a mode of travel that will reduce their total trip time.

The attitude analysis, therefore, displays the riders stated reason for using transit, but the time-cost analysis refines the reasons for use data, by putting into perspective, the two basic considerations that are the determinants in any decision to choose a mode to travel.

Figure V-5 also displays reasons for each type of [illegible] [illegible]. This was derived by summarizing all appropriate categories into either a time or cost category. The resulting figure indicates that the majority of the riders chose transit because of time considerations (59%) while cost considerations account for 39%.

The fact that time considerations are in the majority is substantiated by the time of day data gathered in the survey which indicated that riders from Coventry (the majority of the daily riders) are very sensitive to time savings (73%) by taking transit. The users of [illegible] and [illegible] which make up a substantial percentage ([illegible]) of the ridership originators) also indicated time savings over cost savings as a motive of travel.

In summary, time is the factor behind the majority of the reasons to utilize the transit operation. It indicates that the transit operation is perceived by the majority of riders as a mode of travel that will reduce their total trip time.

The attitude analysis, therefore, displays the rider's specific reason for using transit, but the time-cost analysis reduces these reasons for use down, by putting into perspective, the two basic considerations that are the determinants in any decision to utilize a mode of travel.

D. PREVIOUS MODE OF TRAVEL

Data and information concerning the previous mode of travel for present South Shore Extension transit riders is one of the major indicators of the impact of the new transit line and is indicated by Figure V-E.

A total of 45% of the riders were "New Transit Riders" of which 29% previously used private automobiles, either as drivers or passengers, directly to their destinations, and 16% which did not make this trip previously.

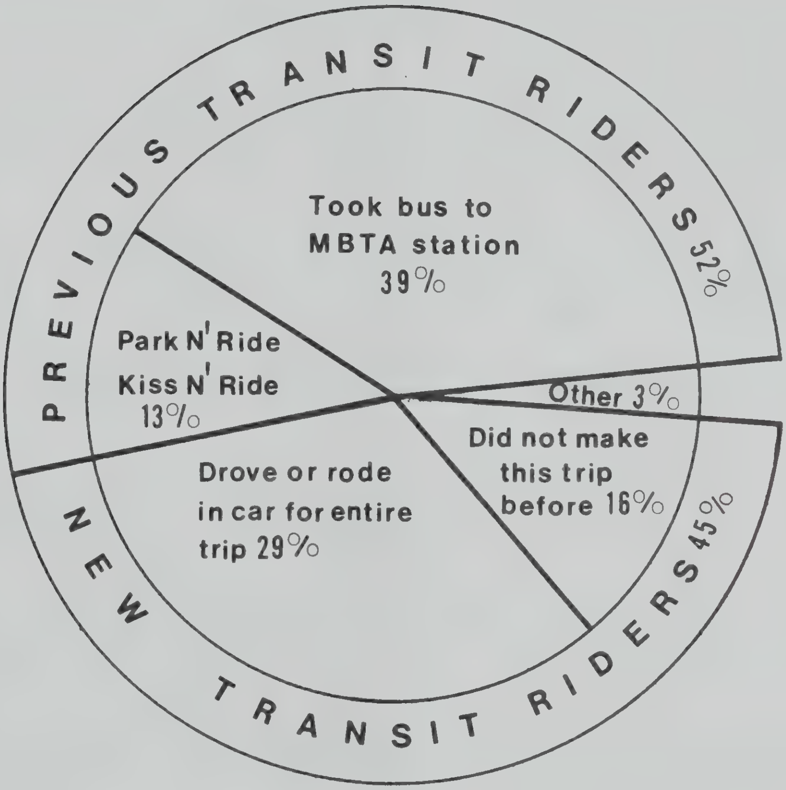
A total of 52% of the riders were "Previous Transit Riders" of which 13% drove or were dropped off at other MBTA stations, and 39% were previous bus riders to MBTA transit stations. The remaining 3% fell into "Other" or "No Answer" categories.

The data illustrates that the majority of the present riders were former mass transit users, i.e., 52%; while 45% are new transit users. Therefore, the new transit service has served to replace older, less efficient forms of mass transit in the South Shore corridor as well as attracting new transit riders. The new facility has been successful in attracting a significant percentage (29%) of previous car uses. When the line is extended to South Quincy or Braintree and better access and more parking facilities are provided, the success of the transit extension in attracting previous car users will be even more apparent.

The relatively large percentage (16%) of the responses which indicated that they did not make this trip before indicates that

PREVIOUS MODE

(South Shore Transit Riders)



(All Day)

MBTA - MAPC Survey
South Shore Transit Line
April, 1972

they did not make this trip before indicates a strong trend for transit to carry "new" or "induced" trips. Some of the new trips, however, would be made regardless of the transit facility; i.e., students starting high school or college in Boston; or a person who has just moved to the South Shore.

A comparison between the previous mode of travel and the reasons given for using the transit system provides insights into the motivations behind the decisions to use transit, see Table V-5.

In general, those who were previous car users are shown to be avoiding the inherent car commuting problems. The previous mass transit users (especially bus users) are shown to be concerned with car commuting problems but not to the extent as previous car commuters. Rather, the previous mass transit users cite the lack of a car, direct connections, and time savings as the most important reasons for using the system.

Those riders who did not previously make the trip indicated that their primary reason for using transit was to avoid traffic problems. Significantly, however, 25% indicated that they had no car. Therefore, the transit service provided access to Boston for the first time for a large segment of those who previously did not make the trip.

A comparison of previous modes and purpose of trip also reveals not unexpected relationships, see Table V-6. Workers (the largest purpose for use category) comprise the major proportion of each previous mode category. People commuting to work were more likely [illegible] or "Induced" trips. None of the new trips, however, would be made regardless of the transit facility, i.e., students attending high school or college in Boston or a person who has just moved to the South Shore.

A comparison between the previous mode of travel and the reasons given for using the transit system provides insights into the motivations behind the decisions to use transit, see Table V-5. [illegible], those who were previous car users are shown to be avoiding the downtown car commuting problems. The previous mass transit users (car availability has been) are shown to be concerned with car commuting problems but not to the extent as previous car commuters. Rather, the previous mass transit users cite the lack of a car, direct connections and time savings as the most important reasons for using the system.

Those riders who did not previously make the trip indicated that their primary reason for using transit was to avoid traffic problems. Significantly, however, [illegible] indicated that they had no [illegible] the first time that a large segment of those who previously did not make the trip.

A comparison of previous modes and purpose of this trip reveals [illegible] relationships, see Table V-6. Workers (the largest [illegible] to be previous car commuters than previous bus commuters. This finding is consistent with data which shows that workers had more availability to cars than any other purpose category.

Other relationships are difficult to interpret from the table since most other percentages are very low and the percentage difference between them is very small. The only possible exception is the 17% of the people who "didn't go" and are now using the transit extension to go to school. Thus the new system could have made it practical for a large number of students to travel to Boston for school, whereas before a practical method of getting to Boston area schools didn't exist. However, this is tempered by the fact that students beginning high school or college in Boston would make the trip regardless of the existance of the transit extension and are using it just because it is there.

A comparison of previous modes of transportation and towns of origin data, see Table V-7, reveals that the three towns in the effective service area (Quincy, Braintree and Weymouth) comprised the majority of users of previous modes and that the three towns' effective service area dominated all specific previous mode categories in a similar manner.

Previous modes of travel, therefore, tend to indicate that the transit line has generally replaced most other forms of mass transit in the area, and that the percentage of previous car users (29%) is less than the percentage of previous mass transit users (52%). Also the data indicates that the transit extension has had

substantial success in attracting previous car users. This implies at least a partial attainment of certain community benefits; i.e., less street traffic, faster rides, etc.

The relationship between previous modes of travel and reason for use revolves around previous car and previous transit uses. The previous car users seem to indicate a strong preference to avoid perceived car commuting problems, while previous transit users have more varied reasons for using the South Shore Extension. Finally, work commuters dominate the previous mode categories, suggesting that riders with trip purposes other than work are not strongly related to certain previous uses. This same phenomenon can be applied to town of origin, since the three towns in the effective service area dominate all previous mode categories in terms of percent of total ridership.

Table V-5

Previous Mode and Reason for Use

Reasons	Car Driver	Car Passenger	Park & Ride	Kiss & Ride	MBTA Bus	Other Bus	Did Not go	Other	No Answer
Avoid downton traffic	60%	30%	47%	25%	18%	28%	33%	19%	19%
Avoid downtown parking	12	8	14	5	6	2	9	4	4
Subtotal (Unwanted auto side effects)	72	38	61	30	24	30	42	23	23
Less travel time	4	9	14	16	12	19	8	9	4
Directly to destination	7	14	11	23	21	11	14	16	27
Lower cost	3	2	3	0	1	5	4	7	8
More comfort	3	2	5	4	3	4	3	2	0
Subtotal (Personal transit amenities)	17	27	33	43	37	39	29	34	39
No car available	7	27	2	20	27	16	25	26	31
No bus available	0	2	1	5	6	5	2	2	4
Other	3	6	3	2	5	9	2	9	0
No Answer	1	0	0	0	1	1	0	6	3
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%

Table V-6

Previous Mode and Purpose of Trip

	No Answer	Car Driver	Car Passenger	Park n Ride	Kiss n Ride	Didn't go	T Bus	Other Bus	Other
Work	56%	87%	83%	90%	85%	78%	81%	77%	68%
School	8	5	9	4	7	17	8	10	18
Personal	4	5	4	2	2	2	4	4	3
Shopping	4	2	4	3	3	1	4	6	5
Recreation	12	1	0	0	3	1	1	1	5
Other	4	0	0	0	0	1	1	1	1
No Answer	12	0	0	1	0	0	1	1	0
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%

Table V-7

Previous Mode and Town of Origin

Previous Mode	Quincy	Weymouth	Braintree	Total Effective Service Area	Total Other Towns
Car Driver	44%	14%	10%	67%	33%
Auto Passenger	54	14	11	79	22
Park and Ride	42	15	13	70	30
Kiss and Ride	51	8	15	74	26
T-Bus	74	7	5	85	15
Non-T-Bus	25	16	20	60	40
Did Not Go	58	11	8	77	23
Other	34	1	5	40	60
No Answer	54	4	4	62	38

E. PRESENT MODE OF ACCESS TO STATION

The data derived from the survey indicates that there are four major modes of travel to the transit stations (i.e.) park and ride (all forms), kiss and ride, MBTA bus and walking. Figure V-F displays the modes utilized by inbound riders to reach the transit stations. When totalling all forms of car usage, the data reveals that approximately half of the riders reach the transit stations by car.

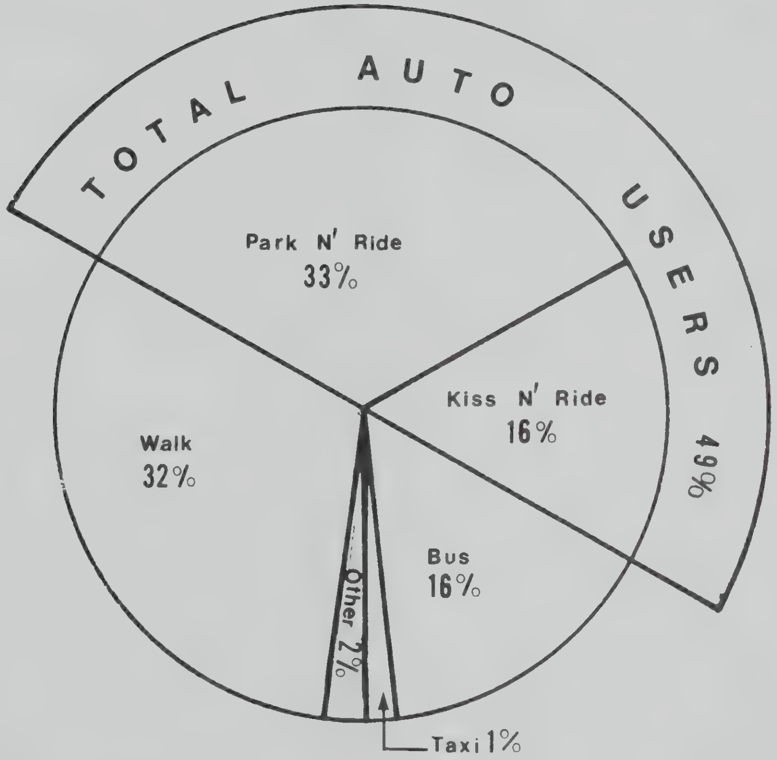
In rand order, the four major modes of travel are:

		Percent	Number
a.	Park and ride	33%	3689
b.	Walk	32%	3518
c.	Bus	16%	1759
d.	Kiss and ride	16%	1759

While the above discussion is valid when referring to the entire extension, it does not indicate the character (in terms of mode of access) of the individual stations, see Table V-8. All the stations are similar in the percent of riders who park and ride. However, kiss and ride patrons at North Quincy and Wollaston Stations are below the three station average, while Quincy Center is considerable above the average. This indicates the relative importance of kiss and ride facilities at Quincy Center which is the terminal station, and its relative unimportance at the other two stations.

Similarly, buses play a small role in North Quincy and an even smaller role in Wollaston, while they accommodate one quarter of the Quincy Center patrons. Finally, only 16% of the Quincy

PRESENT MODE TO STATION
(South Shore Transit Riders)



(All Day)

MBTA - MAPC Survey
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April, 1972

Table V-8

Present Mode of Transportation to Stations

	All Stations	No. Quincy	Wollaston	Quincy Center
Drove to MBTA Lot	27%	32%	32%	27%
Drove to Private Lot	4	1	3	6
Parked on Street	2	1	2	3
Park and Ride subtotal	33	34	37	36
Kiss and Ride	16	14	9	22
Car Pool	1	1	1	1
Other Car subtotal	17	15	10	23
All Car Uses Subtotal	50	49	47	59
MBTA Buses	16	10	3	25
Taxi	1	0	1	0
Walk	32	41	48	16
Other	1	0	1	0
No Answer	0	0	0	0
Total	100%	100%	100%	100%

Center patrons walk to the station while over 40% walk to the other two stations.

Therefore, automobiles are a significant mode of access at all three stations, but at two, Wollaston and North Quincy, more people reach the station by walking than by car. Thus, these two stations may be classified as "walk-in" stations, or stations serving local neighborhood areas. This is not surprising since both stations are located in medium density residential areas. Also, the MBTA has fewer buses servicing these two stations than Quincy Center.

In summary, the South Shore Extension (in terms of present mode of transportation to stations) has two more locally oriented stations, and one station (Quincy Center) that is more regionally oriented.

At all three stations, the peak period of 7:00 AM to 9:00 AM is also the period when each mode of transportation to the stations is most heavily used, see Table V-9. However, while each mode is most heavily used during this period, no particular mode (in terms of the percent of riders utilizing each mode) dominates the other modes of transportation to the stations. This phenomenon is also true for the off-peak hours. Table V-9, therefore, indicates that no mode of transportation dominates another during any part of the day. Rather, utilization of each mode has a similar use pattern to the other modes of transportation to the station.

Table V-9

Mode of Transportation by Time of Use

N. Quincy	Park & Ride	Cum. %	Kiss & Ride	Cum. %	MBTA Bus	Cum. %	Walk	Cum. %
5 - 7 am	4		15		5		6	
7 - 8 am	14	(18)	21	(36)	21	(26)	20	(26)
8 - 9 am	27	(45)	16	(52)	18	(44)	17	(41)
9 -10 am	9	(54)	3	(55)	10	(54)	4	(45)
10 -12 am	10	(64)	9	(64)	4	(58)	9	(54)
12 - 2 pm	7	(71)	2	(66)	3	(61)	7	(61)
2 - 1 am	29	(100)	34	(100)	39	(100)	39	(100)
Wollaston								
5 - 7 am	3		7		13		8	
7 - 8 am	14	(17)	22	(29)	19	(32)	20	(28)
8 - 9 am	29	(46)	21	(50)	23	(45)	24	(52)
9 -10 am	5	(51)	6	(56)	7	(52)	5	(57)
10 -12 am	8	(59)	5	(61)	3	(55)	6	(63)
12 - 2 pm	2	(61)	4	(65)	0	(55)	5	(68)
2 - 1 am	39	(100)	35	(100)	45	(100)	32	(100)
Quincy Center								
5 - 7 am	12		7		7		7	
7 - 8 am	31	(43)	26	(33)	22	(29)	20	(27)
8 - 9 am	14	(57)	22	(55)	20	(49)	20	(47)
9 -10 am	3	(60)	7	(62)	8	(57)	4	(51)
10 -12 am	4	(69)	4	(66)	10	(67)	11	(62)
12 - 2 pm	2	(66)	3	(69)	3	(70)	6	(68)
2 - 1 am	34	(100)	31	(100)	30	(100)	32	(100)

F. ORIGINS

One of the purposes of the transit extension was to provide transit service to South Shore communities as an alternative to automobile commuting. Figures V-G and V-H define the area served by the transit extension by illustrating the origin (by town) of the riders surveyed.

Figure V-G indicates that approximately 94% of the origins are located in the South Shore. In broad terms, the South Shore can be designated as the area serviced by the transit extension. The remaining 6% of the origins are located in cities north of the transit extension, i.e., Boston, Cambridge, Somerville, Medford, Arlington and Brookline and in cities in the southwest corridor, i.e., Norwood, Canton, Easton and Foxborough. The distinguishing factor between the cities north of the extension and those on the south is that, in the cities north of the extension, the majority of the riders are "reverse riders", i.e., riders traveling to Quincy Stations during normally "inbound to Boston" periods. In the South Shore towns, the large majority of the riders are inbound riders, although local riders (those who commute between Quincy Stations) comprise 6% of the total.

As shown, Quincy provides 56% of the ridership, Weymouth 11% and Braintree 9%. These three communities account for approximately 76% of the total ridership. In terms of percent of ridership, Quincy, Braintree and Weymouth are the limits of the current "effective service area". The remaining towns are suburban in

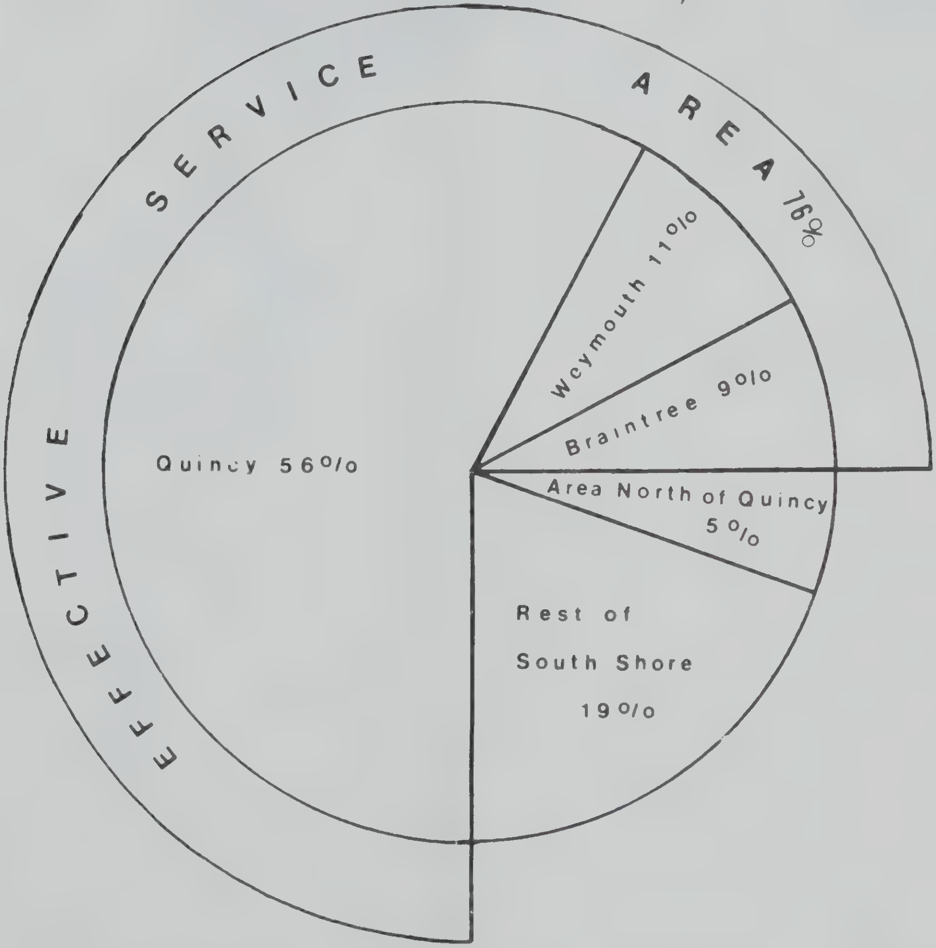
[illegible]

[illegible]

[illegible]

ORIGINS

(South Shore Transit Riders)



(All Day)

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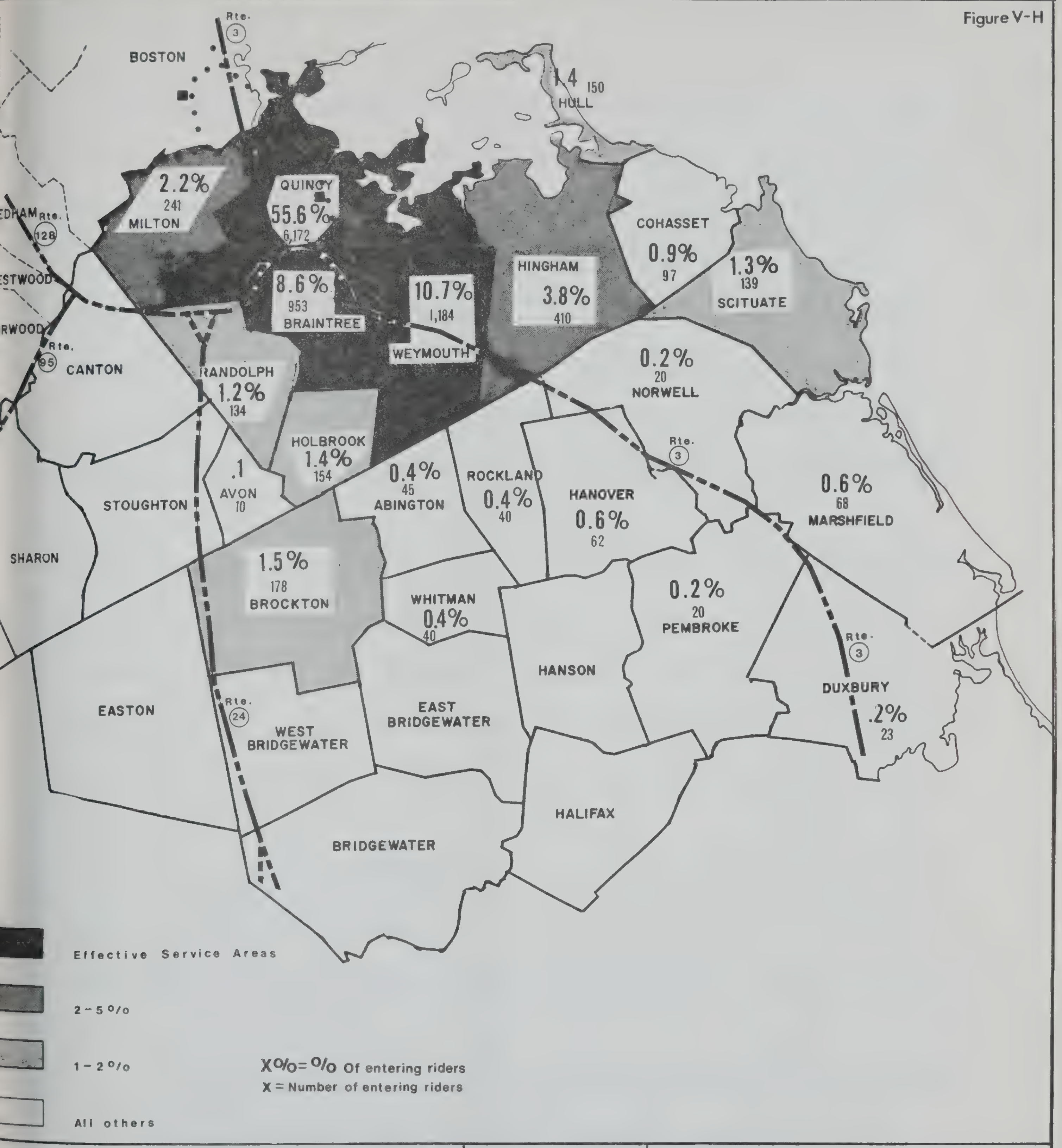
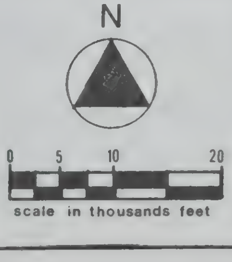
Figure V-H


Rte. 3
BOSTON
1.4 150
HULL
2.2%
241
MILTON
QUINCY
55.6%
6,172
8.6%
953
BRAINTREE
10.7%
1,184
WEYMOUTH
HINGHAM
3.8%
410
COHASSET
0.9%
97
1.3%
139
SCITUATE
EDHAM
Rte. 128
ESTWOOD
RWOOD
Rte. 95
CANTON
RANDOLPH
1.2%
134
0.2%
20
NORWELL
HOLBROOK
1.4%
154
.1
AVON
10
0.4%
45
ABINGTON
ROCKLAND
0.4%
40
HANOVER
0.6%
62
Rte. 3
0.6%
68
MARSHFIELD
STOUGHTON
SHARON
1.5%
178
BROCKTON
WHITMAN
0.4%
40
0.2%
20
PEMBROKE
Rte. 3
HANSON
DUXBURY
.2%
23
EASTON
Rte. 24
WEST BRIDGEWATER
EAST BRIDGEWATER
HALIFAX
BRIDGEWATER
Effective Service Areas
2-5%
1-2%
All others
X%= % Of entering riders
X = Number of entering riders

ORIGIN OF RIDERSHIP
South Shore

SOUTH SHORE IMPACT STUDY


N
0
5
10
20
scale in thousands feet

MBTA - MAPC Survey
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character and past studies indicate that to effectively provide transit in low density areas the system must capitalize on the ability of the automobile to provide good access to transit facilities and to provide adequate parking facilities. The existing transit extension, because it has no direct connections to the major highways in the South Shore, does not as yet meet these requirements; and subsequently is not attracting many potential riders from the suburban areas outside Route 128.

The survey data indicates that, given present parking facilities, access roads and bus routes; there is a relationship between the rider's origin and the mode of access to the station he is likely to employ, see Table V-10. Also see Chapter VI, Section C, concerning the role of buses as a mode of access to the transit stations, and the relationship of buses and cars as competing modes of access, given such factors as closer terminal stations, and the reorganizing of the bus routes with the opening of the transit extension.

There are three different relationships between origin and mode of access. The first relationship is that the riders who originate from towns north of Quincy do not rely on the automobile to any large extent to reach their station. The fact that modern park and ride facilities are not available in many of the communities north of Quincy, and the fact that walking or taking a bus to the station is convenient for many of the riders in Boston, Brookline and Cambridge, supports the data that shows that reverse

[illegible]

[illegible]

Pharmacy in Guinea is [illegible] use made of drugs. The first relationship is that the [illegible], as consequence [illegible] they do not rely on the [illegible] to any [illegible] cannot be reached [illegible]. The fact that [illegible] work and [illegible] facilities are not available in many of the [illegible] of Guinea, and the fact that [illegible] of [illegible] the climate is [illegible] for many of the [illegible] [illegible]

Table V-10

Origin by Mode of Access**

Town	Park & Ride	Kiss & Ride	Bus	Walk	Other	Total Riders
	% Num.	% Num.	% Num.	% Num.	% Num.	% Num.
1 Arlington	20%(3)	0(0)	20(3)	*	0-	14
2 Boston	10%(35)	4(19)	17(60)	59(207)	10(35)	351
3 Brookline	0%	0-	0-	75(17)	25(6)	23
4 Cambridge	5%(3)	0-	11(6)	68(37)	21(11)	54
5 Medford	0%	25(2)	0-	*	25(2)	11
6 Somerville	0%	0	20(3)	*	20(3)	14
7 Easton	100%(14)	0(0)	0(0)	*	2(0)	14
8 Canton	75%(26)	17(6)	0-	0-	8(2)	34
9 Cohassett	83%(89)	3(3)	3(3)	0-	11(12)	97
10 Foxboro	100%(14)	0-	0-	0-	0-	11
11 Holbrook	51%(80)	13(20)	33(52)	0-	4(6)	156
12 Milton	52%(125)	24(37)	11(17)	*	5(8)	241
13 Norwood	75%(9)	25(2)	0-	0-	0-	11
14 Randolph	75%(9)	25(2)	0-	0-	0-	133
15 Stoughton	100%(17)	0	0	0	0	17
16 Abington	75%(35)	13(5)	13(5)	0	0	45
17 Brdgwtr.	70%(19)	0	20(6)	10(3)	0	28
18 Brockton	89%(158)	6(11)	3(5)	0	2(4)	178
19 Duxbury	75%(19)	13(3)	13(3)	0	0	23
20 E.Brdgwtr.	50%(9)	17(3)	17(3)	0	17(3)	17
21 Hanover	68%(42)	27(17)	0	0	5(3)	62
22 Hingham	55%(226)	17(70)	23(94)	0	4(16)	410
23 Hull	64%(96)	9(14)	21(31)	4(6)	2(3)	150
24 Marshfield	54%(37)	42(28)	0-	*	0-	68
25 Norwell	100%(20)	0	0-	0-	0-	20
26 Pembroke	86%(17)	14(3)	0	0	0	20
27 Rockland	71%(28)	7(3)	0	*	14(6)	40
28 Scituate	71%(99)	20(28)	2(3)	0-	6(9)	139
29 Whitman	71%(28)	29(12)	0-	0-	0-	40
30 Braintree	43%(409)	19(181)	31(295)	2(19)	4(38)	953
31 Quincy	18%(1111)	16(988)	14(864)	50(3086)	2%(128)	6,172
32 Weymouth	53%(627)	16(189)	27(319)	0-	0	1,184
Totals	3426	1666	1795	3459	298	11,092***

*Illogical answer

**Expanded numbers are used in this table

***Inbound Ridership Turnstyle Counts

riders from these highly developed areas do not rely on the automobile for access to the station.

The second relationship is an exact opposite of the first. This indicates that the suburban towns of the South Shore (excluding Quincy, Braintree and Weymouth) rely heavily on park and ride and kiss and ride access. The low density suburban areas are shown to have a definite reliance upon the automobile as an access mode to the transit station, given present parking facilities and bus routes.

The third relationship relates to the "effective service area" comprised of Quincy, Braintree and Weymouth. These communities do utilize the automobile for access to the stations, but not to the degree exhibited by the remaining South Shore towns. This fact is especially true in Quincy where approximately one-third of the riders use automobiles to get to the station. The significant fact about the three communities is that they utilize a larger variety of access modes than other communities, i.e., walking and buses are significant modes in these communities.

Therefore, the rider coming from outside Route 128 shows a decided tendency to arrive at the station by car. However, if the origin is in the effective service area, there will be more variety in the modes of access utilized to reach the station. Walking, as in the case of Quincy, is the predominant mode.

The data also shows that Boston and the effective service area (Quincy, Weymouth and Braintree) are the origins of the large riders from these highly developed areas to [illegible] walk for access to the station.

The second relationship is an exact opposite of the first. This indicates that the suburban towns of the South Shore (excluding Quincy, Braintree and Weymouth) rely heavily on park and ride and kiss and ride access. The low density suburban areas are shown to have a definite reliance upon the automobile as an access mode to the transit station, given present parking facilities and bus service.

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Therefore, the rider coming from outside Route 128 shows a decided tendency to arrive at the station by car. However, if the origin is in the effective service area, there will be more variety in the modes of access utilized to reach the station. Walking, as in the case of Quincy, is the predominant mode.

The [illegible] Quincy, Weymouth and Braintree are the [illegible] of the [illegible] majority of the non-work trips, see Table V-11. Thus the remaining towns do not generate, individually, a significant portion of the non-work trips. It is only the towns which have easy and varied access to transit facilities that generate significant portions of the non-work trips.

Quincy residents have the best access to the transit extension; therefore, it is not unusual that they utilize it for a variety of purposes. This illustrates that, the better access one has to transit facilities, the higher the probability that it will be used for purposes other than commuting to work.

Table V-11

Non-Work Trip Purposes and Origin

Purpose of Trip	% of Total Trips	Trips (expanded) Number	% of Non Work Trips				% Non Work Trips	% Non Work Trip other towns	Total %
			Boston	Quincy	Braintree	Weymouth			
Shopping	3	332	9%	62%	4%	6%	81	19	100
School	9	996	4%	55%	10%	11%	80	20	100
Personal Bus.	4	438	14%	43%	10%	13%	80	20	100
Recreation	2	219	7%	40%	9%	11%	68	32	100
Totals	18%	1985							

G. DESTINATIONS

Similar to the dominance Quincy, Braintree and Weymouth have in terms of origins of riders, Boston is the destination of the majority of the riders. Figure V-I is a representation of destinations, as determined by the ridership survey.

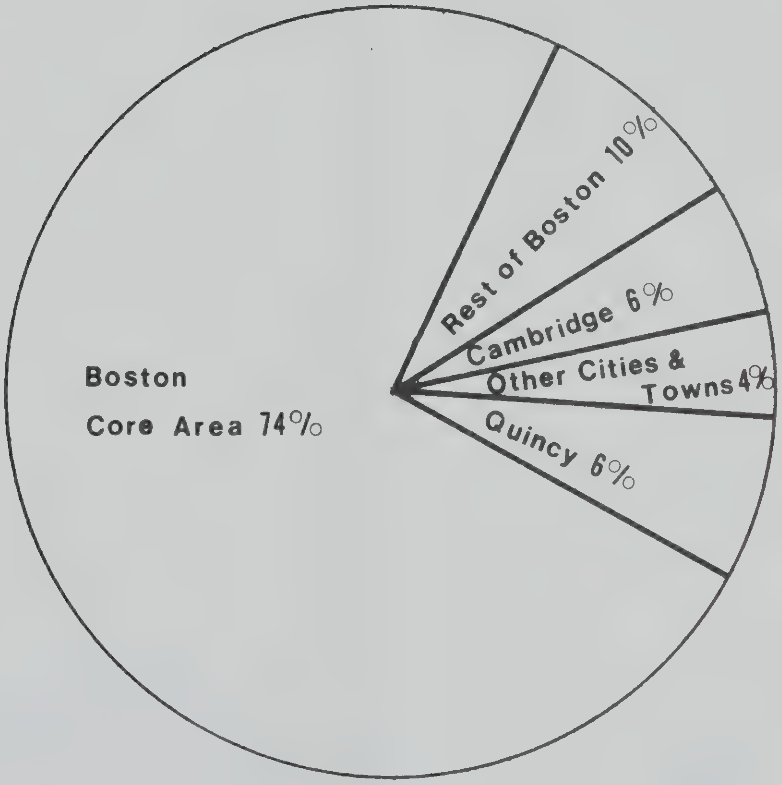
Boston is the desired destination of a great majority of the transit riders (84%). More defined, 74% of the riders are destined for the business-retail core of Boston and 10% to the other sections of Boston. Therefore, Boston in general, and the core area in particular, are the final destinations for the large majority of riders. Only 6% of the riders indicated Cambridge as their destination.

Quincy was the destination for 6% of those surveyed. These riders can be classified as reverse riders and "local riders", i.e., those riders traveling to Quincy (outbound) during normally inbound periods and those riders who enter and exit the transit extension within Quincy. This indicates that the transit extension while not attracting significant numbers of people into Quincy, is providing an alternative mode of travel into Boston, which is the traditional commuter destination for south shore residents.

As stated, the downtown core of Boston is the destination for most riders. Figure V-J divides the core area into functional areas and illustrates the percent of ridership destined for each section.

Figure V-J shows that, as could be expected, the predominantly

DESTINATIONS
(South Shore Transit Riders)



(All Day)

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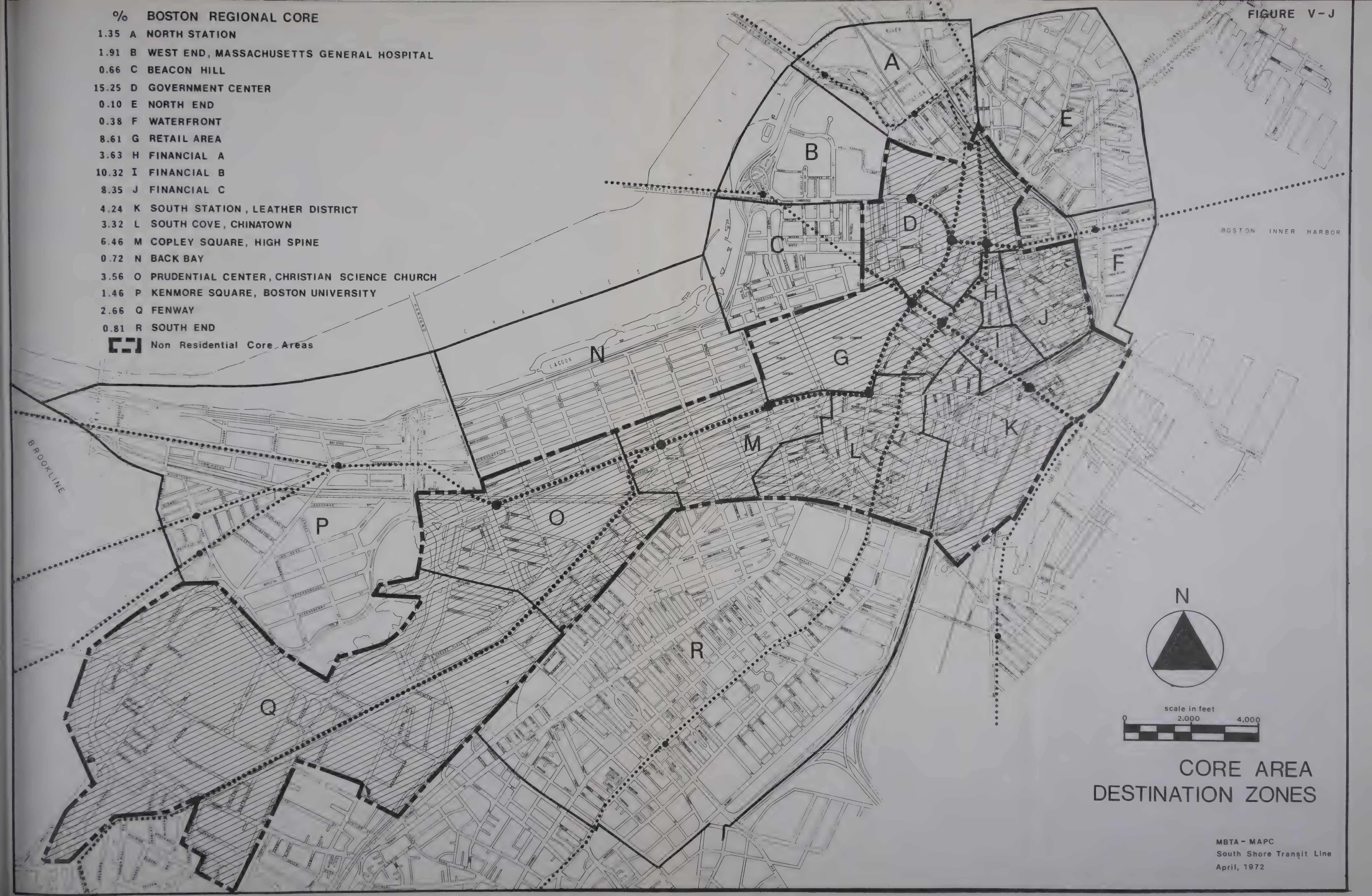
FIGURE V-J


% BOSTON REGIONAL CORE
1.35 A NORTH STATION
1.91 B WEST END, MASSACHUSETTS GENERAL HOSPITAL
0.66 C BEACON HILL
15.25 D GOVERNMENT CENTER
0.10 E NORTH END
0.38 F WATERFRONT
8.61 G RETAIL AREA
3.63 H FINANCIAL A
10.32 I FINANCIAL B
8.35 J FINANCIAL C
4.24 K SOUTH STATION, LEATHER DISTRICT
3.32 L SOUTH COVE, CHINATOWN
6.46 M COPLEY SQUARE, HIGH SPINE
0.72 N BACK BAY
3.56 O PRUDENTIAL CENTER, CHRISTIAN SCIENCE CHURCH
1.46 P KENMORE SQUARE, BOSTON UNIVERSITY
2.66 Q FENWAY
0.81 R SOUTH END
Non Residential Core Areas
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
BOSTON INNER HARBOR
CHARLES
LONGFELLOW BRIDGE
LAGOON
BROOKLINE
N
scale in feet
0
2,000
4,000

CORE AREA
DESTINATION ZONES

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residential areas in the core area (North End, South End, Back Bay, Fenway, Beacon Hill) were not the destinations of many transit riders. Rather, the government and business areas, such as the financial district (H, I, J) and the government center (D) were the major destinations, drawing 22.3% and 15.2% of the riders respectively. The retail area (G) received 8.6% and Copley Square received 6.5% of the riders.

In general, considering the relatively small, effective origin service area, and the very compact primary destination area, it can be stated that the transit extension serves a major origin-to-destination flow originating in Quincy (and to a limited extent in Weymouth and Braintree) and going to the business areas of the Boston core area. This data correlates well with the time of use and purpose of trip data. These three characteristics indicate that the plurality of trips are AM peak period work trips destined for the major regional employment market.

Table V-12 illustrates the origin-destination flow of the riders by town of origin. It shows that, without variation, the core area is the primary destination for all South Shore communities while Quincy is the primary destination area for riders originating north of Quincy.

residential areas in the core area (North End, South End, Back Bay, Roxbury, Beacon Hill) does not [illegible] destination of many transit riders. Rather, the government and business areas, such as the financial district (1, 4, 5) and the government center (3) were the major destinations, drawing 22.5% and 13.2% of the riders [illegible]. The retail area (6) received 8.6% and Copley Square received 6.9% of the riders.

In general, considering the residential nature of the origin service area, and the very compact [illegible] destination area, it can be stated that the transit extension serves a major orientation [illegible] flow originating in Quincy (and to a limited extent in Weymouth and Braintree) and going to the business areas of the Boston core area. This data complies well with the type of use and purpose of trip data. These three sets of statistics indicate that the plurality of trips are [illegible] work trips, destined for the major regional employment centre.

Table V-12 illustrates the origin-destination flow of the riders by town of origin. It shows that, without variation, the [illegible]

[illegible]

Table V-12

Origin and Destination by Town
(By percent)

		Destinations			
Origins	No. Ans.	Core	other Boston	Cambridge	Quincy
1 Arlington	40	20			40
2 Boston	10	17	7	2	61
3 Brookline	25				75
4 Cambridge	26	5		5	64
5 Medford	50				50
6 Somerville	20				80
7 Easton	0	0	100	0	0
8 Canton	17	83	0	0	0
9 Cohassett	6	86	0	6	3
10 Foxboro	0	100	0	0	0
11 Holbrook	4	95	2	0	0
12 Milton	8	89	5	4	0
13 Norwood	0	100	0	0	0
14 Randolph	0	87	4	9	0
15 Stoughton	0	100	0	0	0
16 Abington	0	100	0	0	0
17 Bridgewater	10	70	10	0	10
18 Brockton	2	99	2	3	0
19 Duxbury	0	88	0	12	0
20 E. Bridgewater	17	66	0	0	17
21 Hanover	9	77	9	5	0
22 Hingham	5	86	1	8	0
23 Hull	6	79	44	11	0
24 Marshfield	4	87	0	8	0
25 Norwell	0	93	0	7	0
26 Pembroke	21	80	0	0	0
27 Rockland	8	80	12	0	0
28 Scituate	0	100	0	0	0
29 Whitman	0	100	0	0	0
30 Braintree	7	82	6	5	2
31 Quincy	6	75	4	8	6
32 Weymouth	5	85	3	5	2

H. NEW TIME AND OLD TIME

The questions concerning the time involved in the trip (old time and new time) received on of the lowest response rates in the ridership survey. The data, also contains some inconsistences and illogical answers. However, if these shortcomings are recognized, the data when carefully scrutinized, can provide viable information.

Table V-13 relates the differences in the average time for all trips from the "effective service area" (Quincy, Braintree and Weymouth).

Table V-13

NEW TIME AND OLD TIME
(minutes)

	Avg. New Times	Avg. Old Times	Avg. Time Saved	Time Savings %
Quincy	21	33	+12	36
Braintree	43	46	+ 3	7
Weymouth	42	45	+ 3	7
Other Towns	38	39	+ 1	3

The above table indicates that, while on the average, all towns reflect a time savings, only the time savings for Quincy is significant, i.e., the average trip time was reduced by a very substantial 36% in Quincy, while riders from Braintree and Weymouth had time savings of 7%, and all other towns had time savings averaging 3%. Except for Quincy, the relatively insignificant savings in time can be related to the low percentage (10%) of the riders that indicated time savings was the principal reason for their

using transit. Time savings, therefore, are more apparent in Quincy and the "effective service area" than in the entire South Shore region.

Figure V-K indicates how much time was actually saved, by how many people. As shown, the largest segment of those answering the survey question indicated no change in time. Figure V-K also indicates that most of the time savings were in the order of 10 to 20 minutes and most of the time losses were in the order of 5 to 10 minutes. Of those sampled, 93% saved time or experienced no variation in travel time, and only 7% indicated a loss in time.

Figure V-L compares the time involved in the present transit trip to the time saved and to the time lost. It illustrates that most people (excepting those originating in Quincy) did not save large amounts of time using transit. Rather, the majority of people saved 15 minutes or less. Also, the majority of those who lost time had relatively long trip times prior to transit. Thus, transit, in a few cases, made some long trips longer, while in a few instances causing a few short trips to become moderately long.

To conclude, time savings have resulted because of transit use and this is particularly evident in Quincy. Also, the majority of significant time savings are confined to the effective service area.

Figure V-K

NUMBER OF TRIPS AND TIME SAVED AND LOST

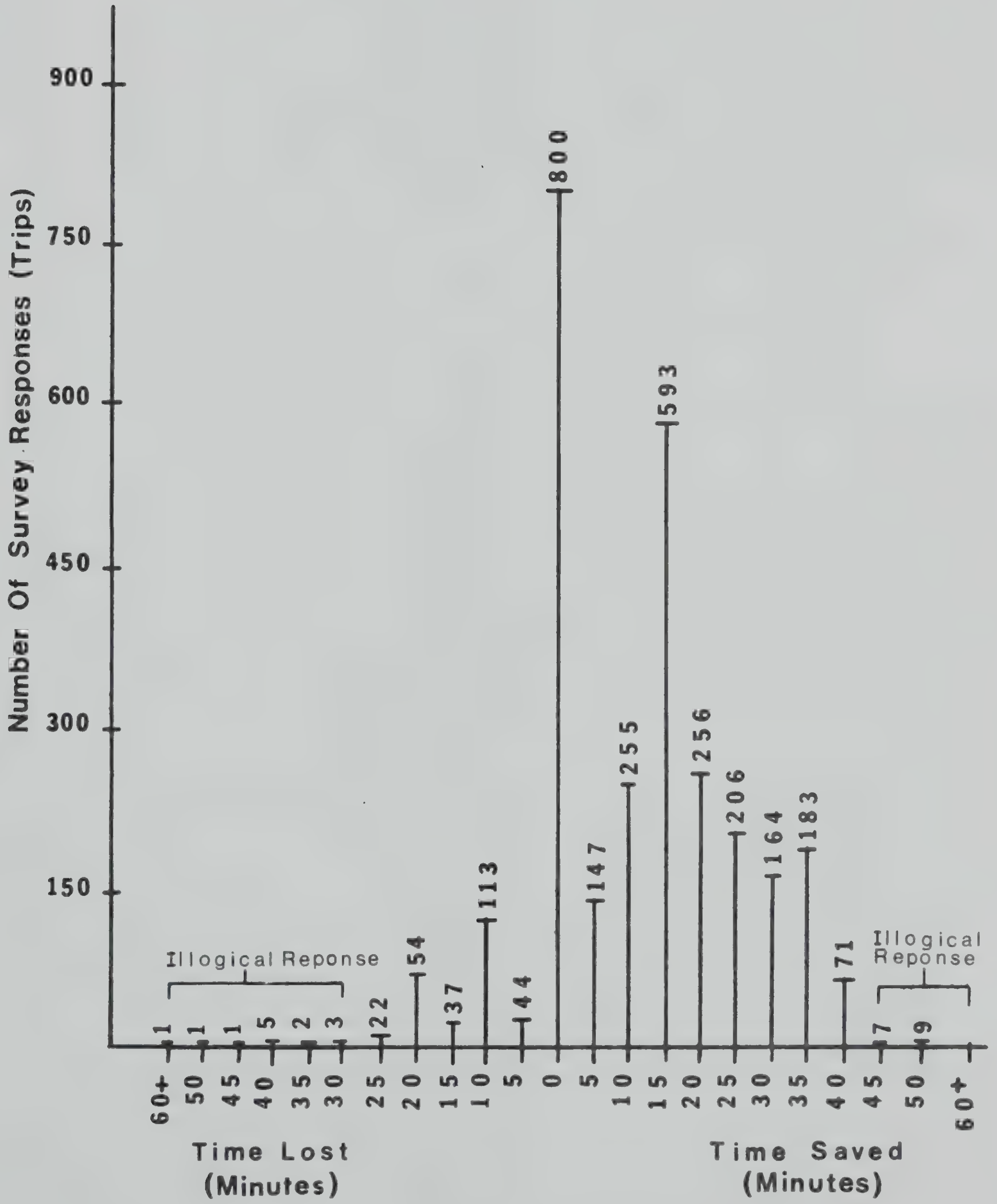

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Figure V -L

TRANSIT TRAVEL: Time Saved and Lost

(Minutes by Number of Riders)

	Present Trip Time (Minutes) 5	10	15	20	25	30	35	40	45	50	60
TIME SAVED (MIN.) 40				28	43						
35			18	0	25	190					
30		1	0	47	0	46	70				
25		1	2	0	25	0	23	155			
20		3	4	27	0	189	0	33			
15	2	0	18	22	35	0	90	0	426		
10	0	3	9	31	15	53	0	93	51		
5	1	5	3	10	23	13	25	0	0	67	0
0	4	2	1	13	16	63	17	47	204	16	417
TIME LOST (MIN.) 5	4	2	1	13	16	63	17	47	209	16	47
10	0	0	0	3	8	9	19	10	0	0	8
15				2	6	16	8	22	29	29	0
20					1	5	10	5	16	0	84
25					1	1	3	6	36	7	0
30						1		3	13	5	15
35								0	0	3	
40								1			

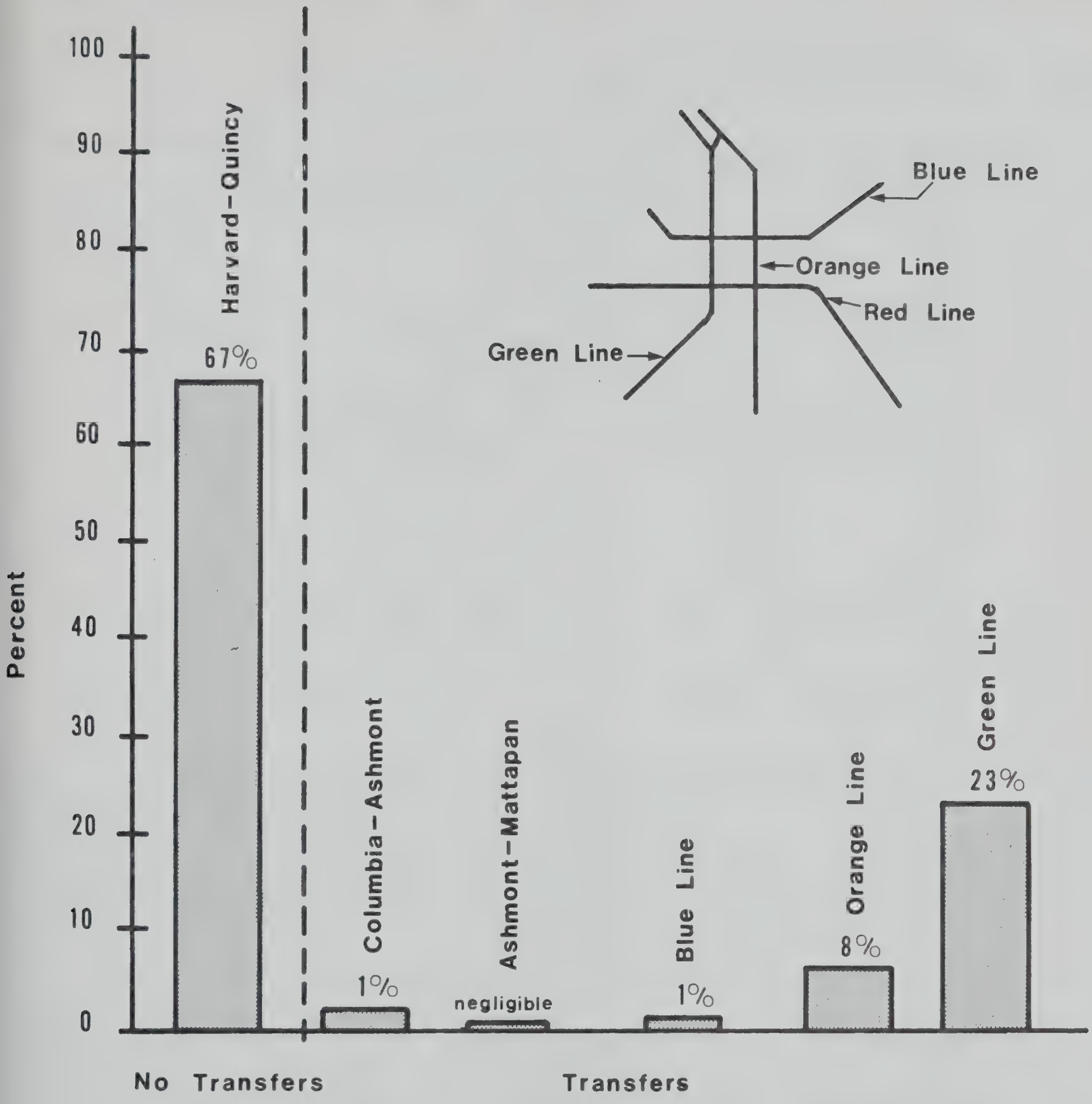
X = Each box contains the number of persons who saved or lost a certain number of minutes as compared to their present trip time.

I. TRANSFERS AT DESTINATION END OF TRIP

Information concerning the transit line of exit and the propensity to transfer can further define the destination characteristics of the riders on the south shore extension. Figure V-M indicates that the large majority of the riders exit the system from a Red Line station (67%). This indicates that the line is serving a general "area to area" transportation desire line and that for the majority of people, it is providing direct connections. The Red Line stations that serve the core area are South Station, Washington Street Station and Park Street Station. Therefore, considering that most Red Line riders are going to the business section of the core area, it follows that the three stations mentioned above are the transit station destinations for the largest segment of the riders on the South Shore line.

Figure V-M also indicates that only the Orange Line and the Green Line have a significant proportion of Red Line transfers, 8% and 22% respectively of the total ridership. Considering that transfer to the Orange or Green line only involves one change and that two transfers or a doubling back are needed to reach the Blue Line; it is not unusual that the Orange and Green Lines receive the bulk of the Red Line transfers. Furthermore, since the Green Line has many stations within the core area (the destination of most Red Line riders) it is logical that the Green Line receives the most transfers from the Red Line.

PERCENT OF TRANSFERS FROM RED LINE (ALL DAY)



MBTA - MAPC Survey
South Shore Transit Line
April, 1972

J. RIDERSHIP COMMENTS

The ridership survey forms included a space for written comments. There were 3917 returned questionnaires which were validated. Each questionnaire was coded as containing no comment, one comment, two comments, three comments or four comments. The distribution of comments was as follows:

Table V-14

Distribution of Comments

Number of Written Comments	Number of Questionnaires
4	158
3	501
2	1503
1	3044
Comment Subtotal	5206
0	873
Grand Total	6079

There were a total of 5,206 written comments made by 3,044 riders. Only 873 riders chose not to comment. The average number of written comments per returned questionnaire was 1.3 (5206/3917).

Table V-15 displays the results of these comments by grouping the comments into generalized categories. Table V-16 is a listing of all individual comments received and indicates the total range of all comments.

The ridership survey form contained a space for written comments. [illegible] were validated. Each questionnaire was coded as registering no comment, one comment, two comments, three comments or [illegible] comments. The distribution of comments was as follows:

Table V-14

Distribution of Comments

Number of Written Comments	Number of [illegible]
4	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
1	[illegible]
[illegible]	[illegible]
0	[illegible]
[illegible] Total	[illegible]

There were a total of 5,[illegible] written comments made by [illegible] riders. [illegible] riders chose not to comment. The average number of written comments per returned questionnaire was 1.3 ([illegible]).

Table V-15 displays the results of these responses by grouping the comments into generalized categories. Table V-16 is a listing of all individual comments received and indicates the total [illegible] of all comments.

Table V-15

General Comments

Group	Description	Number of Responses	Percent of Responses
A	Improve Service, Operations, etc.	1978	38%
	Fewer delays, breakdowns	356	
	More frequent trains	778	
	More Express trains	92	
	Don't bypass stations	83	
	More Uniform headways	119	
	Equalize Ashmont-Quincy service	105	
	Use Public address system	206	
	Bad weather service	25	
	Operations	82	
	Amenities	132	
B	Safety, Security, Courtesy	634	12%
	Improve safety	17	
	Improve security	76	
	Improve courtesy	76	
	Improve efficiency	74	
	Pleased with service	391	
C	Improve Stations	557	11%
	Construct bus shelters	20	
	Construct enclosed shelters in stations	318	
	Improve cleanliness, lighting	57	
	Miscellaneous	162	
D	Improve Trains	475	9%
	Better Maintenance	186	
	Add seats and straps	209	
	Faster trains	80	
E	Bus Service	477	9%
	Coordinate train-bus service	89	
	More buses in off peak	47	
	Increase existing service	243	
	Increase "outlying" service	51	
	Add mini buses	17	

Group	Description	Number of Responses	Percent of Responses
F	Further Extension Southerly	275	5%.
	For	270	
	Against	5	
G	Fares, Deficit	232	4%
	Lower fares	182	
	Sell commuter ticket books	31	
	Deficit too high	19	
H	Improve other MBTA Service	202	4%
	Other transit lines	96	
	Other stations	60	
	Commuter rail	18	
	Miscellaneous	28	
I	Parking	151	3%
	Increase capacity	125	
	Lower rates	26	
J	Other Comments	255	5%
	Other than previously listed	255	
	Comments Subtotal	5206	100%
K	No Responses	873	
	No comments written	873	
	GRAND TOTAL	6079	

Table V-15 shows that of the 5206 comments received, that 1978 (38%) were aimed at improvements in service, operations, schedules, etc. The single largest comment (778) was to have more frequent trains. This comment may not be directed completely towards lowering the existing headways as much as towards maintaining those headways. A close examination of all of the individual comments in this category (as shown in Table V-16), indicates that all of these comments (1978) are directly related to the rider's perception of how long he has to wait on the platform for a train. The preponderance of comments relating to this category displays that frequency of service is foremost in the rider's attitude. This comment reinforces the conviction that "maintenance of service or frequency" should continue to be a priority goal.

Safety, Security and Courtesy rank as the second highest category of comments with 634 responses (or 12%). Interestingly enough, while there were comments about improving safety, security and courtesy; it should be noted that there were 391 comments stating that the respondents were pleased with the service. This implies that while people are concerned about safety, security, courtesy and frequency of service, that a significant portion of the ridership is cognizant of the difficulties in provided a system of public transportation and have indicated their approval of the present service.

The improvement of trains or vehicles (9%) and the improvement of stations (11%) indicate a desire for a continual upgrading of

the physical facilities used in providing a public transportation service. Considering a combination of these two categories, only 243 comments were maintenance or upkeep type responses while 1,032 were "constructive" type responses in that they concerned "additions" to the physical systems such as hand straps, shelters, etc. This indicates not only a desire for continued maintenance but also for the addition of other "amenities" to increase comfort and acceptability.

Approximately 9% of the comments were related to bus service. The comments are all essentially directed either towards increasing existing bus service or expanding it to additional areas. In light of the other survey data which indicates that 16% of the ridership arrives by bus, analysis of this comment indicates that the MBTA must make all possible efforts to insure that bus service operations, schedules and routes are being continually reviewed towards the goal of providing the best possible bus service both for transit feeder and local needs.

There were 275 comments on a further transit extension to the south. Of these, 270 voiced a positive comment, while only 5 voiced opposition. Considering that these comments were written by the riders themselves and were unsolicited, there seems to be no doubt that riders almost unanimously favor the proposed extension beyond Quincy Center.

Only 4% of the comments referred to the cost of the service. This implies a public acceptance of the concept that the user does not particularly mind paying an out-of-pocket cost if he considers [illegible] public [illegible]

[illegible] nation of these two categories, only 2[illegible] comments were [illegible] while 1,0[illegible] were "constructive" [illegible] in that they commented "additions" to the physical system such as [illegible], etc. This indicates not only a desire for [illegible] but also for the addition of other "amenities" to increase comfort and [illegible]ability.

Approximately 9[illegible] of the comments were related to bus service. [illegible] comments [illegible] directed at more buses [illegible] bus service [illegible] and local areas. In view of the other survey data which indicates [illegible] of the riders [illegible] this comment indicates that the MTA must make all possible efforts to insure that bus service operations, schedules and routes are being continually reviewed toward the goal of providing the best possible bus service both for transit [illegible] and local needs.

There were 2[illegible] comments on a further transit extension to the south. Of these, 270 voiced a positive comment, while only 5 [illegible] by the riders themselves and were unsolicited, there [illegible] no doubt that riders almost unanimously favor the proposed [illegible]

Only 4% of the comments referred to the cost of the service. This implies a public acceptance of the concept that the [illegible] paying [illegible] the cost reasonable with respect to the service provided. In the face of no evidence to the contrary, it can be concluded that this is the case on the South Shore line.

Approximately 4% of the responses were directed towards other parts of the public transportation system. Most comments were requests for improvements to other MBTA lines and stations, while some were directed at commuter rail improvements. This suggests that many, if not all, of the riderships' comments are most likely applicable to the general total public transportation system.

Comments on parking comprised only 3% of the responses received. In a sense, this is somewhat surprising in that 33% of the ridership are park and ride patrons. Under the general assumption that written comments tend to be negative or critical and that almost all of the parking comments are directed towards increasing parking capacity, the thesis can be advanced that patrons consider parking an important mode of travel to transit stations; that they are reasonably satisfied with the parking provided; and that parking facilities should be created to satisfy the demand in so far as practical.

In summary then, these written comments can be interpretive of the ridership's attitude towards public transportation in general and the South Shore Extension in particular. The more important considerations appear to be:

1. Improve and maintain frequency of train service
2. Keep the system safe and secure

[illegible] to the service provided. [illegible]

[illegible]

[illegible]

Approximately 4% of the responses were directed towards other parts of the public transportation system. Most comments were requests for improvements to other MBTA lines and stations, while some were directed at commuter rail improvement. This suggests that many, if not all, of the ridership's comments are most likely applicable to the overall total public transportation system.

Comments on parking comprised only 1% of the responses received. In a sense, this is somewhat surprising in that [illegible] of the ridership are park and ride patrons. Under the general assumption that written comments tend to be negative or critical and that almost all of the parking comments are directed towards increasing parking capacity, the results can be construed that patrons consider parking an important mode of travel to transit stations; that they are reasonably satisfied with the parking provided; and that parking facilities should be created to satisfy the demand in so far as [illegible]

In summary then, these written comments can be interpretive of the ridership's attitude towards public transportation in general and the South Shore Extension in particular. The more important considerations appear to be:

1. [illegible]

2. [illegible]

3. An indication of acceptance of the system
4. Additions to the physical plant and equipment
5. Improve and increase bus service
6. Extension of the transit service further southerly
7. Out-of-pocket cost not unreasonable
8. Parking essential and should be related to demand

These attitudinal aspects should be considered an integral part of the MBTA's continuing program of improving present service and as a direct input in the planning, design and operation of future services.

Table V-16

LISTING OF INDIVIDUAL COMMENTS

Comment Number	Description	Number of Responses	Percent of Responses
Group A -	IMPROVE SERVICE, OPERATIONS, ETC.	1978	38%
03	Leave doors open longer enabling other passengers to board	34	
05	Get into Park Street in 15 minutes as advertised	8	
06	Maintain good service during bad weather	20	
07	Additional cars during bad weather	5	
08	Enforce the No Smoking ban	40	
09	Pipe in music on trains	18	
10	Avoid sudden stops and starts	40	
19	Control temperature and ventilation on cars	74	
23	Fewer tie ups, breakdowns, and delays	301	
24	- especially in P.M. peak	46	
25	- especially in A.M. peak	9	
35	Use public address system to inform passengers of delay on trains (cause, time)	174	
98	Use public address system to inform passengers of delays	32	
11	More frequent trains at peaks	181	
12	More frequent trains in AM peak	71	
13	More frequent trains in PM peak	245	
14	More frequent trains during day	14	
15	More frequent trainst Sat., Sun.	15	
16	More frequent trains holidays	2	
17	More frequent trains at night	62	
18	More frequent trains (no time specified)	188	
22	Headway between trains should be more uniform & reliably spaced	119	
58	Equalize the number of Ashmont trains to # of Quincy trains	105	
66	Run more express trains	44	
67	especially to Park Street	17	
68	especially to Washington	7	
69	especially to So. Station	24	
27	Don't by-pass stations for express trains	34	
28	- especially at N. Quincy Station	1	
29	- especially at Wollaston	0	
30	- especially at Park	8	
31	- especially at Kendall	28	
32	- especially at Other Station	12	

Table V-15 (Continued)

Group B -	SAFETY, SECURITY, COURTESY	634	12%
02	Improve security on trains	32	
26	Improve safety	10	
82	Improve security at Park. lots	15	
83	Improve safety	5	
84	Improve snow, ice removal	2	
94	Improve security	29	
33	Improve employee courtesy on trains	69	
56	Improve employee efficiency and politeness	74	
92	Improve employee courtesy at change booths	7	
76	Generally pleased with service	391	
Group C -	IMPROVE STATIONS	557	11%
36	Build shelter for bus patrons	5	
37	at: Wollaston	5	
38	N. Quincy	2	
39	Quincy Center	8	
85	Build enclosed shelters	101	
86	at: Wollaston Station	163	
87	North Quincy	30	
88	Quincy Center	24	
89	Cleaner stations	51	
90	Build restrooms at stations	6	
91	Additional change booths	13	
93	Mailboxes, concessions, conveniences at stations	81	
95	Improve lighting	6	
96	Operable escalators	31	
97	Improve signs, maps, directions	31	
Group D -	IMPROVE TRAINS	475	9%
01	Add hold straps and bars	64	
04	Clean up cars	48	
20	Additional seating	145	
21	Faster trains	80	
34	Cars too noisy	7	
57	Maintain equipment and system	131	

Table V-15 (Continued)

Group E -	BUS SERVICE	447	9%
40	Have buses wait at station (for late trains coordinate service)	89	
42	Operate mini buses	17	
43	More buses earlier in A.M.	16	
44	More buses later in P.M.	31	
45	More frequent or improved service	66	
46	to Squantum	9	
47	to S. Dorchester	25	
48	to Hingham	17	
49	to Weymouth	23	
50	to Braintree	34	
51	to Cohasset	2	
52	to Milton	6	
53	Inside Quincy	61	
54	More frequent or improved service to other South Shore areas	32	
55	Other areas or undesignated area	19	
Group F -	FURTHER EXTENSION SOUTHERLY	275	5%
70	Extend line further south	270	
71	Do not extend line further south	5	
Group G -	FARES, DEFICIT	232	4%
41	Lower rates	66	
72	50¢ fare is too high	93	
73	50¢ fare is not equitable since rest of system costs only 25¢, etc.	23	
74	Sell monthly or weekly commuter passes at reduced rates	31	
75	Deficit too high	19	
Group H -	IMPROVE OTHER MBTA SERVICE	202	4%
59	Improve other parts of the MBTA:	28	
60	Blue Line	7	
61	Green Line	51	
62	Huntington-Arborway Line	38	
63	Park Street	50	
64	Other Boston stations	10	
65	Commuter rail	18	

Table V-15 (Continued)

Group I - PARKING		151	3%
77	Increase capacity	32	
78	at: Quincy Center	76	
79	Wollaston	3	
80	North Quincy	14	
81	Lower rates	26	
Group J - OTHER COMMENTS		255	5%
99	Complaint or suggestion other than those listed above	255	
	SUBTOTAL: ALL COMMENTS	5206	100%
Group K - NO ANSWER		873	
00	No comments written	873	
	GRAND TOTAL:	6079	

K. SOCIO-ECONOMIC CHARACTERISTICS

Figure V-N displays a summary of the relevant socio-economic characteristics derived from the survey data.

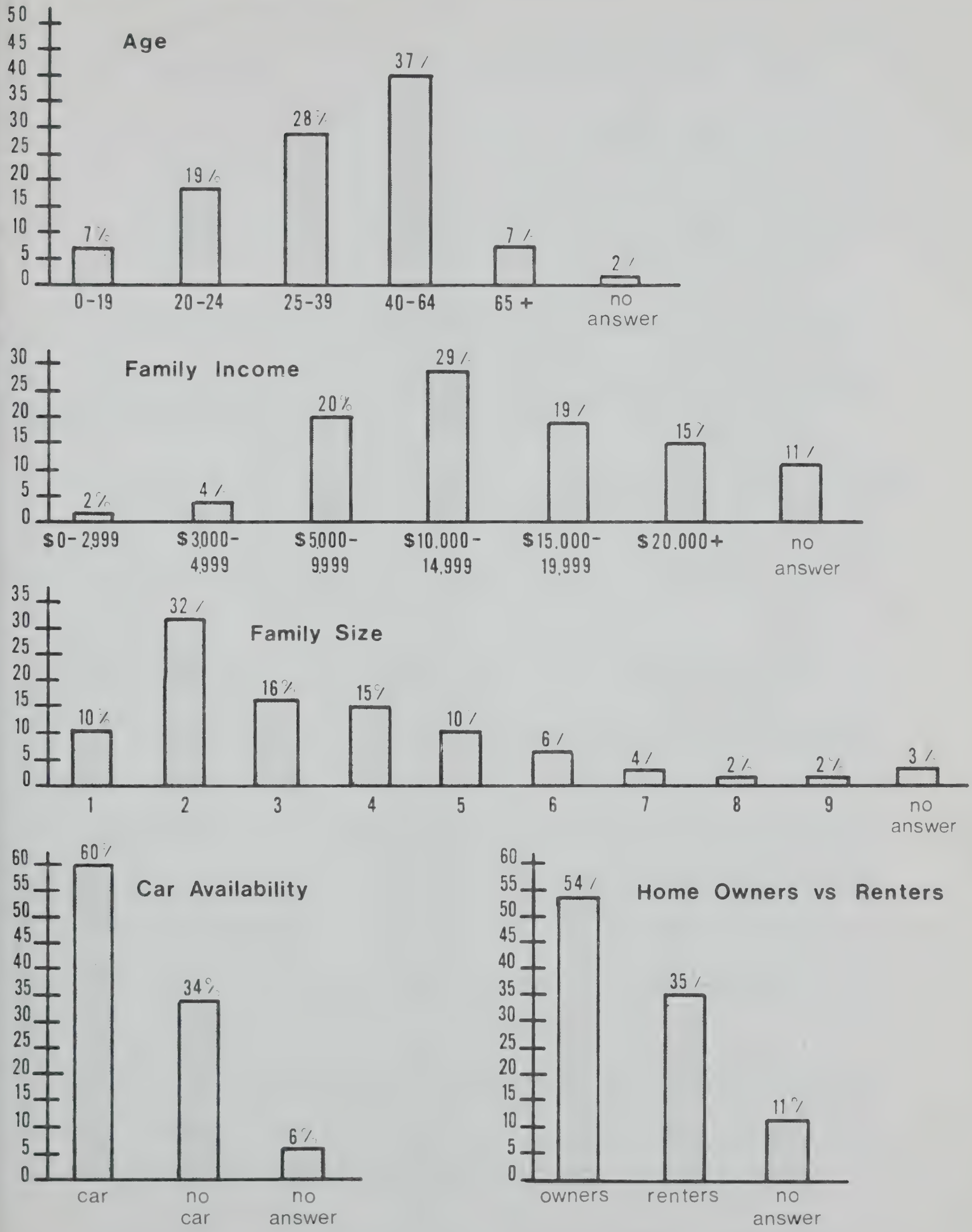
The data shows that the large majority (84%) of the riders are members of the "labor force" group, 20-64 years old. This fact correlates well with purpose of trip data which indicated that 82% were going to work. The data also reveals that 7% were between the ages of 0-19, which also correlates well with the 8% who indicated that they were going to school. The elderly comprised 7% of the ridership. The data indicates that the average age of the riders was approximately 30 years old.

The income levels reported indicate that the mean income level of the riders is approximately 14,000 dollars. Therefore, the average rider on the South Shore extension is a relatively affluent person. A cross tabulation relating age to income shows that income levels have the expected age distribution, i.e., the elderly riders, 65+ years old, have the highest percentage of incomes under 3000, and the lowest percentage over 15,000 dollars. The more middle aged income groups have significant percentages in each income level.

Family size is a further definition of social characteristics of the transit rider. Considering that the survey had responses from significant numbers of people in all age groups and income categories, it was expected that the family size data would reflect the average family size of the South Shore region.

Figure V N

RIDERSHIP COMPOSITE



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South Shore Transit Line
April 1972

The survey reports that the average family size of the rider is 2.5 persons. The 1970 census figures for Massachusetts indicate that the South Shore had approximately 3.1 persons per family. Thus, the survey data is .6 of a person below the census data.

The 2.5 persons family size is totally out of character for a suburban region such as the South Shore whose age group composite bearing age.

The question may have been confusing in that many of those surveyed may have possibly left themselves out of the figure they reported. The other possible conclusion is that the transit facility attracts many single people and people with small families. Since more data is at this time not available, no definite conclusion with respect to the meaning of the family size data can be achieved.

The majority of the riders own their own homes, while a significant minority are renters. Again, as is the problem with personal questions, the response rate is relatively low, and in this case, the size of the no answer category casts doubt on the validity of the owners to renters ratio shown above. Nevertheless, the data does indicate that the majority do own their own homes, and this fact is consistent with the relatively high income levels reported from the survey.

Considering the data on home ownership and income levels, it is not unexpected that a majority of the riders have access to a car, i.e., 60% have a car available while 34% reported no car [illegible] family size of the rider is 2.5 persons. The [illegible] census figures for Massachusetts indicate that the South Shore had approximately 3.1 persons per family. Thus, the survey data is .6 of a person below the census data. The 2.5 persons family size is totally out of character for a suburban region such as the South Shore whose age group composition [illegible].

The question may have been confusing in that many of those surveyed may have possibly left themselves out of the figure they reported. The other possible conclusion is that the transit facility attracts more single people and people with small families. Since more data is at this time not available, no definite conclusion with respect to the meaning of the family size data can be achieved.

The majority of the riders own their own homes, while a significant minority are renters. Again, as in the other more personal questions, the response rate is relatively low, and in this case, the size of the no answer category casts doubt on the validity of the owners to renters ratio given above. Nevertheless, the data does indicate that the majority do own their own homes. [illegible] from the survey.

[illegible] not unexpected that a majority of the riders have access to a car, i.e., 60% have a car available while 34% reported no car available. The data, therefore, suggests that approximately 1/3 of the riders have a certain amount of dependence on mass transit for the intended trip.

The survey revealed that the average rider is approximately 30 years old, owns a home, has a car available for commuting, has a family income of approximately $14,000 per year and is from a family of about three persons. This "average person" is going to work, and is using transit between the hours of 7:00 - 9:00 A.M.

When comparing the "average rider" with the "average South Shore resident" (family income of $15,000, average family size of 3.1, median age of 32); it is evident that the transit extension's rider does not reflect the socio-economic characteristics of the captive market sector of total ridership (the poor, aged, young, infirm and carless). Rather the data suggests that the "average transit rider" closely resembles the "average south shore resident".

In summary, the "average rider" displays the same characteristics of the "average resident". While the transit extension does serve a significant number of transportation disadvantaged people, its typical rider has socio-economic characteristics that strongly suggests that the typical rider has the capacity for alternate means of transportation other than transit.

L. LOCAL RIDERS

Utilizing actual warrants collected on the day of the survey, it was observed that 1,332 riders were local riders, (entered and exited the transit system in Quincy). This represents 6% of the total daily ridership. This is a significant percentage of daily ridership, and it may have numerous economic and traffic impact implications.

The survey data, however, related that only 1% of the riders are local riders. The survey data, as mentioned earlier, is very consistent with other turnstyle count information and known characteristics of South Shore commuters. Thus, the survey data while generally applicable to most analysis in this report, may not be valid in a discussion of local rider characteristics.

Therefore, considering the problems associated with using data that may not be reliable, this study will not comment further upon ridership characteristics of local riders. However, considering that they number 6% of the total ridership, it is suggested that future studies be designed to specifically analyze local rider characteristics.

CHAPTER VI

IMPACTS ON TRAFFIC VOLUMES AND PATTERNS

One of the objectives for constructing the South Shore Extension was to alleviate the increasing traffic pressure on the already saturated arterial highways of the South Shore corridor, particularly during peak commuting hours. This portion of the study examines the regional and local impacts the South Shore Rapid Transit Extension has had on traffic volumes and patterns in the South Shore corridor.

The major conclusion of this chapter is that the transit extension has neither reduced total inbound ADT nor has it reversed the trend of increasing peak hour volumes. However, the traffic surveys indicate that the new transit extension has reduced the peak hour volume rate of increase. Vehicular through traffic on the major facilities of the corridor still exhibits the long term characteristics of automobile orientation.

A. REGIONAL TRAFFIC IMPACTS

The South Shore Rapid Transit Extension commenced operations in September of 1971. In anticipation of the transit service, the Massachusetts Department of Public Works, monitored vehicular traffic at fifty locations south of the Neponset River in November and December of 1970. The configuration of these stations provided a multiple screenline interception of traffic north and south of the three transit stations in Quincy. It also provided a cordon

of counting locations surrounding the three transit stations. In order to determine the impacts of the rail transit extension, the vehicle counts were repeated during November and December of 1971 approximately three months after the transit line opened. Figure VI-A illustrates the location of each station.

Screenline 1 is designated as the Weymouth, Braintree and Randolph Screenline. It is furthest south of the three screenlines and it indicates the traffic volumes generated by the suburbs south of Quincy. Table VI-1 indicates the stations comprising Screenline 1 and the changes of the vehicular counts from 1970 to 1971.

Table VI-1 indicates that, for the entire screenline, the ADT increased 13.6% while the peak hour volume increased 11.1%. Station 1 (Commercial Street in Weymouth), Station 3 (Washington Street in Weymouth) and Station 5 (Rt. 3 in Weymouth) had the largest increases in ADT and peak hour volumes. At this point, it is significant to note that Washington Street in Weymouth, which had an increase in ADT of 20.2%, also registered the largest increase in peak hour demand, 17%. Washington Street can be used by Weymouth residents as a direct connection to Quincy Center and the MBTA park and ride facilities. Also, it is significant that the major highway in the screenline, Route 3, had the largest increase in peak hour volume 14.2%. Thus, vehicular through traffic on the major facilities in this portion of the south shore corridor continues to show characteristics of automobile orientation.

Screenline 2 is designated as the Braintree - Quincy Screenline. Table VI-2 indicates the stations comprising Screenline 2 and the

[illegible]

[illegible]

[illegible] counts were expected during November and December of 1971, approximately three months after the South Shore line opened. Figure VI-2 illustrates the location of each station.

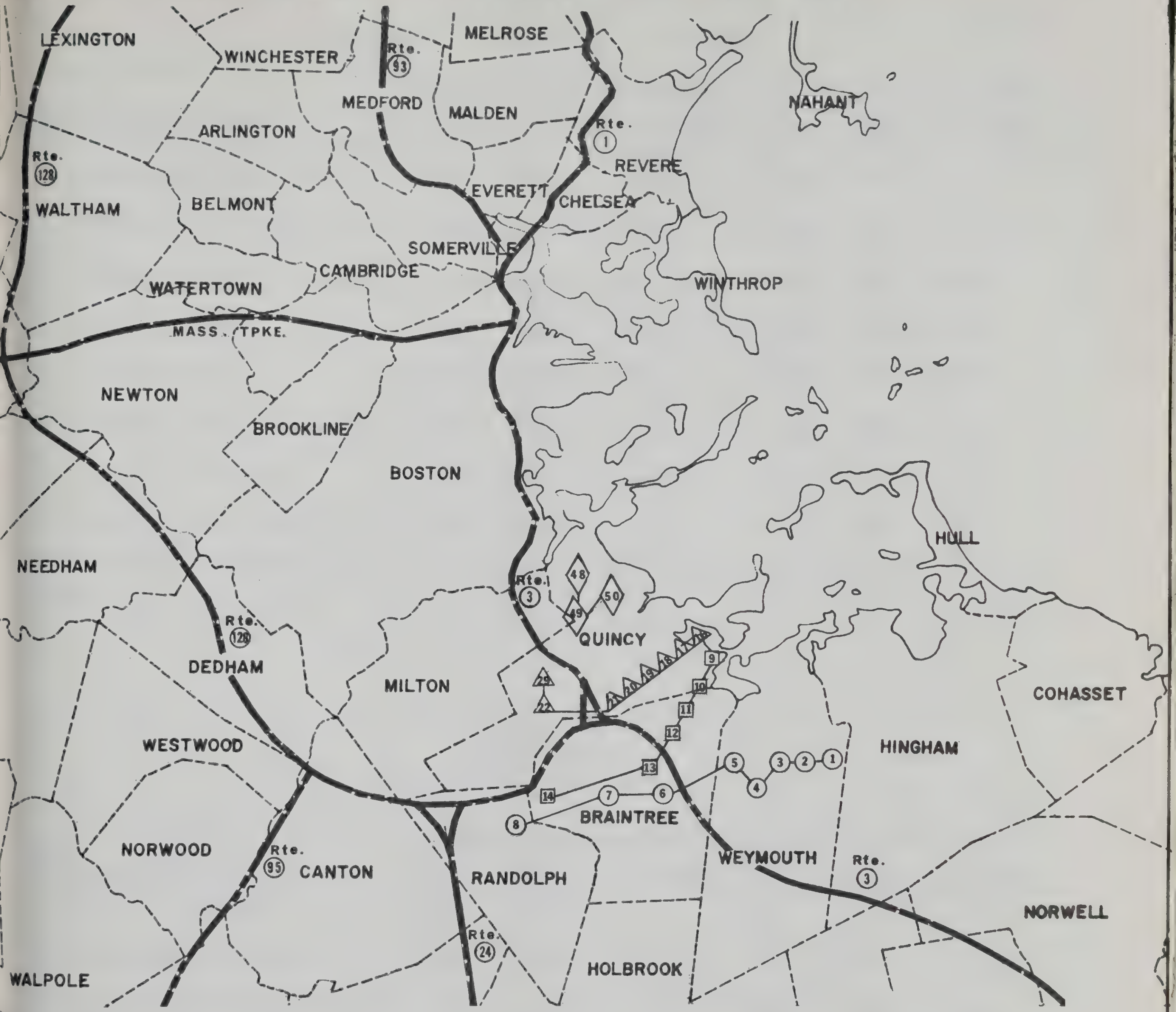
Screenline 1 is designated as the Weymouth, Braintree and Plymouth Screenline. It is farthest south of the three screenlines and it indicates the traffic volumes generated by the suburbs south of Quincy. Table VI-1 indicates the stations comprising Screenline 1 and the changes of the vehicular counts from 1970 to 1971.

Table VI-1 indicates that, for the entire screenline, the ADT increased 13.6% while the peak hour volume increased 11.1%. Station 1 (Commercial Street in Weymouth), Station 3 (Washington Street in Weymouth) and Station 5 (Rt. 3 in Weymouth) had the largest increases in ADT and peak hour volumes. At this point, it is significant to note that Washington Street in Weymouth, which had an increase in ADT of 20.2%, also registered the largest increase in peak hour demand, 17%. Washington Street can be used by Weymouth residents as a direct connection to Quincy Center and the MBTA park and ride facilities. Also, it is significant that the major highway in the screenline, Route 3, had the largest increase in peak hour volume 14.2%. Thus, vehicular through traffic on the major facilities in this portion of the south shore corridor continues to show characteristics of automobile orientation.

Screenline 2 is designated as the Braintree - Quincy Screenline. Table VI-2 indicates the stations comprising Screenline 2 and the

FIGURE VI-A

RAFFIC MONITORING STATIONS 1970 and 1971


LEXINGTON
WINCHESTER
Rte. 93
MELROSE
MEDFORD
MALDEN
NAHANT
ARLINGTON
Rte. 1
Rte. 128
REVERE
WALTHAM
BELMONT
EVERETT
CHELSEA
SOMERVILLE
CAMBRIDGE
WATERTOWN
WINTHROP
MASS. TPKE.
NEWTON
BROOKLINE
BOSTON
HULL
NEEDHAM
Rte. 3
48
50
49
Rte. 128
QUINCY
DEDHAM
9
29
10
MILTON
22
11
COHASSET
12
WESTWOOD
HINGHAM
13
5
3
2
1
4
14
7
6
BRAINTREE
8
NORWOOD
Rte. 95
CANTON
WEYMOUTH
Rte. 3
RANDOLPH
NORWELL
Rte. 24
HOLBROOK
WALPOLE

○ SCREENLINE 1
□ SCREENLINE 2
◇ SCREENLINE 3
△ PEAK HOUR SCREENLINE A

scale in feet
10,000 20,000

N

outh Shore Transit Line
BTA-MAPC Survey
pril,1972

SCREENLINE 1

Station #	Location
1	Commercial St. (Weymouth)
2	Middle St. (Weymouth)
3	Washington St. (Weymouth)
4	Route 18 (Weymouth)
5	Route 3 (Weymouth)
6	Liberty St. (Braintree)
7	Route 37 (Braintree)
8	Granite St. (Randolf)

SCREENLINE 2

Station #	Location
9	Route 3A (Quincy)
10	Quincy/Braintree (Town Line)
11	Commercial St. (Braintree)
12	Route 3 (Braintree)
13	Washington St. (Braintree)
14	Granite St. (Braintree)

SCREENLINE 3

Station #	Location
48	Route 3A (Quincy)
49	S.E. Expressway (Quincy)
50	Granite Ave. (Quincy)

PEAK HOUR SCREENLINE A

Station #	Location
16	Route 3A (Quincy)
17	Washington St. (Quincy)
18	Quincy Ave. (Quincy)
19	Franklin St. (Quincy)
20	Center St. (Quincy)
21	Route 3 to Expressway (Quincy)
22	Route 128 to Expressway (Quincy)
29	Willard St. (Quincy)

TABLE VI-1
SCREENLINE 1
WEYMOUTH - BRAINTREE - RANDOLPH

Station Location	INBOUND DAILY TRAFFIC 1970	1971	% Change	INBOUND AM PEAK HOUR 1970	1971	% Change
1. Commercial St. (Wey.)	3900	4660	+19.5	425	455	+ 7.0
2. Middle St. (Wey.)	4000	4320	+ 8.0	258	256	- 0.8
3. Washington St. (Wey.)	4700	5650	+20.2	324	379	+17.0
4. Rt. 18 (Wey.)	7100	7600	+ 7.0	527	576	+ 9.3
5. Rt. 3 (Wey.)	34800	42290	+22.0	5588	6381	+19.2
6. Liberty St. (Brain.)	3700	3780	+ 2.0	511	544	+ 6.5
7. Rt. 37 (Brain.)	9600	9960	+ 9.0	1141	1253	+ 9.8
8. Granite St. (Rand.)	5500	5580	+ 1.5	557	526	- 5.6
Total	73,300	83,240	+13.6	9,331	10,370	+11.1%

TABLE VI-2
SCREENLINE 2
BRAINTREE - QUINCY LINE

Station Location	INBOUND DAILY TRAFFIC 1970	1971	% Change	INBOUND AM PEAK HOUR 1970	1971	% Change
9. Rt. 3A (Quin.)	16750	16760	-	2016	2511	+24.6
10. Quin/Brain. T.L.	11850	11500	- 3.0	975	1221	+25.2
11. Commercial St. (Brain)	1450	1720	+18.6	160	189	+18.1
12. Rt. 3 (Brain)	39900	39810	- 0.2	5577	6051	+ 8.5
13. Washington St. (Brain)	8400	11590	+38.0	693	1262	+82.1
14. Granite St. (Brain)	14700	14220	- 3.0	1728	1760	+ 1.9
Total	92950	95600	+2.6	11149	12944	15.6

*ADT: Average Daily Traffic

collected data. It is less suburban oriented than is Screenline 1, but, the traffic monitoring stations are still south of the South Shore Extension's terminal station, Quincy Station.

Table VI-2 indicates that the total ADT monitored at Screenline 2 increased at a slower rate than that of Screenline 1, i.e., 2.6% as compared to 13.6%. It should be noted that it is a general characteristic of screenline counts that the screenline furthest from the destination area in question (in this case Screenline 1) will exhibit larger increase rates in ADT than subsequent screenlines closer to the general destination area, especially if the traffic is moving from a suburban or developing area to an urban or developed area.

While the total impact to ADT may vary depending upon the strength of the trip generating land uses between the screenlines, the characteristic mentioned above is primarily due to cars being counted at Screenline 1 reaching their destination before passing through Screenline 2. In this instance, considering the two recorded rates of ADT increases, some of the difference can be attributed to the fact that the cars entering Screenline 1 are from developing areas which register relatively large population and auto registration increases yearly. The area between Screenlines 1 and 2 is an urban and more developed area and does not register rates of increase in population and registrations as high as a developing area.

In terms of peak hour demand, however, Screenline 2 increased

15.6% as compared to 11.1% for Screenline 1. Station 9 (Route 3A Quincy), Station 10 (Quincy, Braintree townline), Station 11 (Commercial Street, Braintree), and Station 14 (Washington Street, Braintree) all exhibited large increases in peak hour traffic volume after the three Quincy MBTA stations became operational in 1971. Considering that all the routes mentioned above can be used as a major connection to the Quincy MBTA stations and parking facilities; and that no new large peak hour trip generating land use was developed in this area between 1970 and 1971; it is logical to assume that the large increase in peak hour traffic was due primarily to the presence of the three Quincy MBTA stations and related parking facilities.

Screenline 3 is designated as the Neponset River Crossing Screenline. It monitored the volumes of traffic on the major facilities, north of the Quincy MBTA stations, entering Boston. Table VI-3 indicates the traffic volumes on the roads and locates the stations comprising Screenline 3.

The data collected for Screenline 3 indicates a decrease in the rate of ADT increase when compared to Screenlines 1 and 2. However, as mentioned previously, this phenomenon is characteristic of one directional screenline counts as one approaches the designated destination area. Screenline 3, however, exhibits a much lower increase in peak hour volumes than does Screenline 2.

To further expand on the impact to peak hour traffic volumes, Tables VI-4 and VI-5 illustrate the data gathered at two hour peak period screenlines for 7-9 A.M. northbound traffic.

(8.0% as compared to 11.1% for Screenline 1). Routes [illegible] (Quincy), Franklin St. (Quincy), Hancock Street (Quincy), Washington St. (Quincy), Granite St. [illegible] and [illegible] Braintree all exhibited large increases in peak hour traffic volumes after the three Quincy MBTA stations became operational in 1971. Considering that all the routes mentioned above can be used as a major connection to the Quincy MBTA stations and parking facilities, and that no new large peak hour trip generating land use was developed in this area between 1970 and 1971, it is logical to assume that the large increase in peak hour traffic was due primarily to the presence of the three Quincy MBTA stations and related parking facilities.

Screenline 2 is designated as the Neponset River Crossing screenline. It monitored the volumes of traffic on the major facilities, north of the Quincy MBTA stations, entering Quincy. Table VI-3 indicates the traffic volumes on the roads and streets that comprise Screenline 2.

The data collected for Screenline 3 indicates a decrease in the rate of AADT increase when compared to Screenlines 1 and 2. However, as mentioned previously, this phenomenon is characteristic of the peripheral screenlines located on the boundaries of the study urban construction area. Screenline 3, however, exhibits a much lower increase in peak hour traffic than does Screenline 1.

To further expand on the impact to peak hour traffic volumes, Tables VI-4 and VI-5 illustrate the data collected in the a.m. peak period and the 4-6 P.M. afternoon peak.

TABLE VI-3
SCREENLINE 3
NEPONSET RIVER CROSSING

Station Location	INBOUND DAILY TRAFFIC 1970	1971	% Change	INBOUND AM PEAK HOUR 1970	1971	% Change
48. Rt. 3A Quincy	24100	18600	-13.1	2908	2980	+2.5
49. S.E. XWay	40000	44370	+10.9	4740	4895	+2.2
50. Grante Ave. (Quin.)	12500	13900	+11.2	1836	1951	+6.2
Total	76900	77270	+ 0.5	9484	9776	+3.8

TABLE VI-4
SCREENLINE 2A
NORTHBOUND TRAFFIC
TWO HOUR PEAK PERIOD (7-9 A.M.)

Station	Quincy Location	Vehicle Counts 1970	1971	% Change
16	Rt. 3A	2245	2665	+ 9.8
17	Washington Street	900	1075	+19.4
18	Quincy Avenue	1401	1503	+ 7.3
19	Franklin St.	1030	1123	+ 9.0
20	Centre St.	675	423	-37.3
21	Rt. 3 to Expressway	5434	6013	+10.7
22	Rt. 128 to Expressway	3123	4040	+28.8
29	Willard Street	1293	1135	-12.2
30	Wampatuck Road	97	38	-60.8
Total		16198	18015	+11.9

TABLE VI-5
SCREENLINE 3A
NORTHBOUND TRAFFIC
TWO HOUR PEAK PERIOD (7-9 A.M.)

Station	Location	Vehicle Counts 1970	Vehicle Counts 1971	% Change
48	Rt. 3A Neponset River	4158	5516	+32.7
49	S.E. X Way R.C. Smith Bridge	9272	10057	+ 8.4
50	Granite Ave. Neponset River	3148	2227	-41.4
Total		16578	17800	+ 7.4

The increase in the two hour peak period vehicular trips crossing the Neponset River was approximately 7.4%, (Table VI-5) which is more than the average annual assumption of 4%. Thus the South Shore Extension has not reversed the trend of car commuting in the south shore corridor, but rather tended to prolong the peak period.

While the 2 hour peak period volume was increasing at a rate of 7.4% for Screenline 3A; it was increasing by 11.9% for Screenline 2A, south of the Quincy MBTA Stations. Table VI-4 indicates that stations 16, 17, 18, 19 (all of which are major travel routes to Quincy Center) exhibited increases in peak period volumes. The increased peak hour volumes at the stations noted above and the fact that the peak period volume percentage increase below the Quincy MBTA Stations is greater than the increase at the Neponset River Crossings, indicates that the South Shore Rail Rapid Transit Extension has had some effect on peak rate of increase, but it has

not been able to reduce actual peak period demand below pre-transit extension levels.

Also of significance in Tables VI-4 and VI-5 is the data concerning station 50 (Granite Ave), Station 20 (Centre Street), Station 29 (Willard Street), and Station 30 (Wampatuck Road). These roads had a reduction in their peak period volumes, which ran counter to the trend of the screenlines of which they were a part. More importantly, however, is that these streets (Centre, Willard and Wampatuck) are local Quincy collector streets leading to Granite Avenue which is an important access route to public transportation; i.e., the Mattapan High Speed Trolley to Ashmont. The data indicates, therefore, that some previous park and ride commuter destined for Mattapan and Ashmont have been diverted to Quincy Stations, or are now being serviced by feeder bus routes.

In summarizing the regional traffic impacts, it is clear that the transit extension has neither reduced total inbound ADT nor has it reversed the increasing peak hour volumes. However, the traffic surveys indicate that the new transit extension has reduced the peak hour volume rate of increase. Vehicular through traffic, however, on the major facilities of the corridor, still exhibits the long term characteristics of automobile orientation.

Quincy is the focus of much of the regional through traffic impacts of the new system. This is substantiated by the major increases in ADT and peak hour volume south of Quincy; the change in the rate of peak hour volume from below to above the three [illegible] reduce actual peak period [illegible]

[illegible].

Also of significance in Tables VI-4 and VI-5 is the [illegible] counting station 50 (Granite Ave), Station 20 (Quincy Street), Station 29 (Willard Street), and Station 30 (Wampatuck Road). These roads had a reduction in their peak period volumes, which run counter to the trend of the screenlines of which they were a part. More importantly, however, is that these streets [illegible] Willard and Wampatuck) are local Quincy collector streets leading to Granite Avenue which is an important access route to public transportation; i.e., the Mattapan High Speed Trolley or A[illegible]. The data indicates, therefore, that some previous park and ride commuter destined for Mattapan and Ashmont have been diverted to Quincy stations, or are now being serviced by feeder bus routes.

In summarizing the regional traffic impacts, it is clear that the transit extension has neither reduced total inbound ADT nor has it reversed the increasing peak hour volumes. However, the traffic surveys indicate that the new transit extension has reduced the [illegible]. [illegible] however, on the major facilities of the corridor, still exhibits [illegible] long been characteristics of automobile congestion.

Quincy is the focus of much of the regional through traffic [illegible] of the new system. This is substantiated by the major [illegible]creases in ADT and peak hour volumes south of Quincy, the change [illegible] value from below to above the three

Quincy Stations; the shift in park and ride commuter from Mattapan - Milton - Ashmont boarding points; and the fact that the largest amount of park and ride patrons originate from Quincy, 31.2%. Thus while some regional impacts are discernible, the major impacts seem to affect Quincy more than the remainder of the South Shore.

The fact that the terminal station is Quincy Center, and that it is not conveniently reached by all south shore commuters, has had a large role in reducing the transit extension's impact on the South Shore. Quincy Center Station was not originally intended as the terminal station, but if it remains so for the future, its existing lack of parking facilities (the present lot is full by 7:45 - 8:00 A.M.) and its lack of direct highway access will result in the new line not attracting new park and ride or kiss and ride patrons. If this be the case, then ADT and peak hour volumes will probably increase over 1971 levels on the south shore corridor. However, if the line is extended, and more parking facilities are provided, the system may be able to continue to depress the rate of increase of peak hour traffic. Depending on the facilities provided and the length of extension, the line may be able to stablize or reverse the present trend of continuing increases in peak hour volumes.

[illegible] [illegible]. The shift in peak and non-commuter from

[illegible] - [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

largest amount on peak and [illegible] [illegible] [illegible] [illegible] Quincy's

11.1). Thus while some regional impacts are significant, the major impact seems to affect Quincy more than the remainder of the South Shore.

The fact that the terminal station is Quincy Center, and that it is not conveniently reached by all south shore commuters, may hold a large role in reducing the transit extension's impact on the south shore. Quincy Center Station was not originally intended as the terminal station, but if it remains so for some time, the resulting lack of parking facilities (the present lot is full by 7:45 - 8:00 A.M.) and its lack of direct highway access will result in the new line not attracting new peak and off-peak [illegible] patterns. If this be the case, then off-peak hour volumes will probably increase over 1971 levels on the major highway corridor. However, if the line is extended, and more parking facilities are provided, the system may be able to continue to capture the [illegible] increase of peak hour traffic. Depending on the facilities provided and the length of extension, the line may be able to [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] in peak hour volumes.

B. LOCAL TRAFFIC IMPACTS

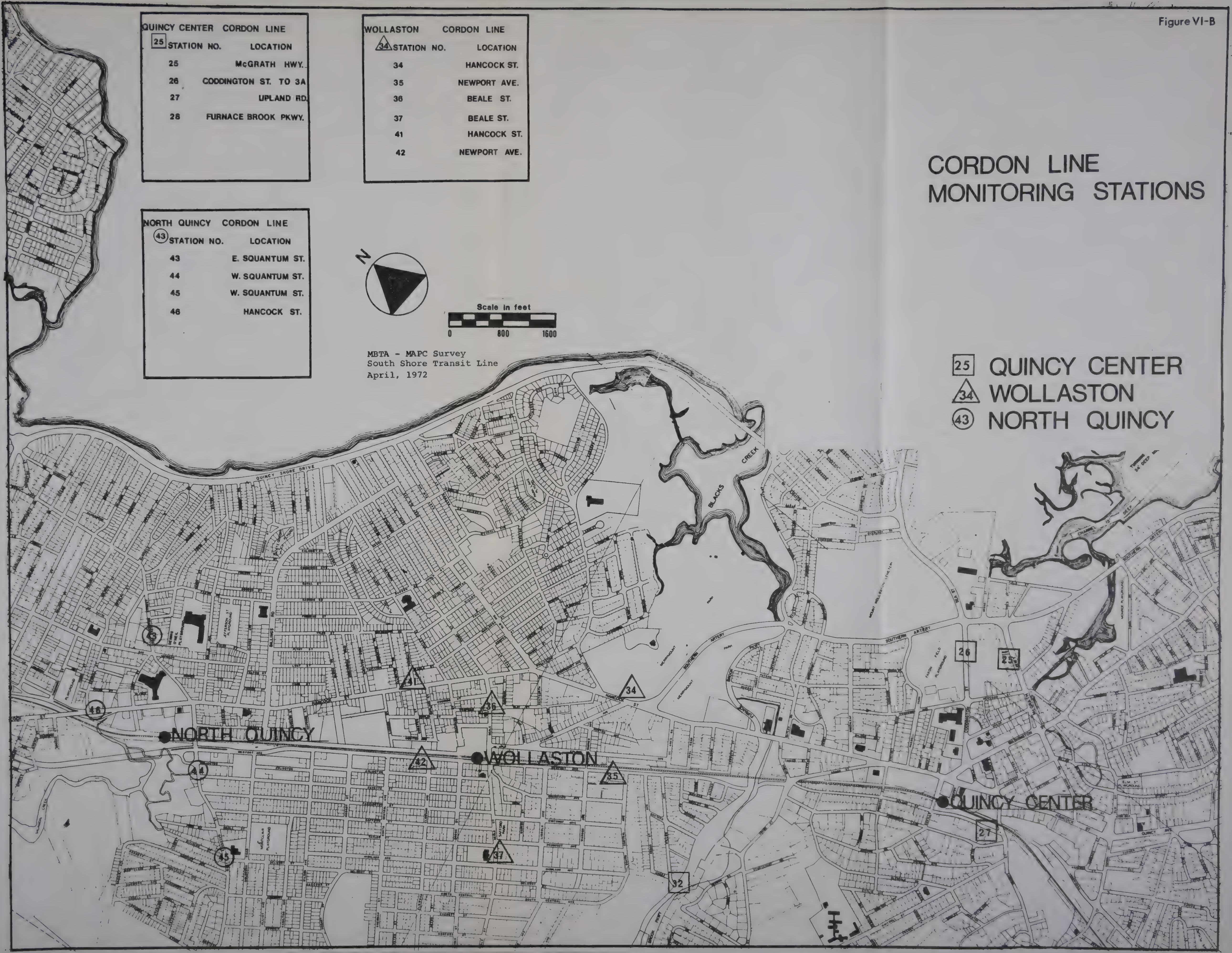
The 1970-1971 Massachusetts Department of Public Works study in the South Shore corridor also established numerous monitoring stations in the vicinity of the three new transit stations. The purpose of establishing these cordon lines was to determine the impact of the transit facilities on traffic volumes in neighborhoods adjacent to the stations. Tables VI-6, VI-7 and VI-8 present the information gathered from the various cordon lines. Figure VI-2 displays the locations of these monitoring stations.

TABLE VI-6
CORDON LINE A
QUINCY CENTER STATION

Station Location	ADT			INBOUND AM PEAK HOUR		
	1970	1971	% Change	1970	1971	% Change
25 McGrath Hwy.	W. 6573	W. 7210	+ 9.7	(8-9) 468	521	+11.3
26 Coddington St. to 3A	W. 4500	W. 4550	+ 1.1	(7-8) 359	397	+10.6
27 Upland Rd.	N. 2900	N. 3200	+10.3	(7-8) 288	294	+ 2.1
28 Furnance Bk. Pkwy	E. 7150	E. 6670	- 6.9	(8-9) 590	506	-14.2
Total	21123	21630	+ 2.4	1705	1718	+ 0.8

Figure VI-B

CORDON LINE MONITORING STATIONS


N
Scale in feet
0
800
1600
QUINCY SHORE DRIVE
BLACKS CREEK
SOUTHERN ARTERY
NORTH QUINCY
WOLLASTON
QUINCY CENTER
25
26
27
32
34
35
36
37
41
42
43
44
45
46
25 QUINCY CENTER
34 WOLLASTON
43 NORTH QUINCY

MBTA - MAPC Survey
South Shore Transit Line
April, 1972

QUINCY CENTER CORDON LINE

25 STATION NO.	LOCATION
25	McGRATH HWY.
26	CODDINGTON ST. TO 3A
27	UPLAND RD.
28	FURNACE BROOK PKWY.

WOLLASTON CORDON LINE

34 STATION NO.	LOCATION
34	HANCOCK ST.
35	NEWPORT AVE.
36	BEALE ST.
37	BEALE ST.
41	HANCOCK ST.
42	NEWPORT AVE.

NORTH QUINCY CORDON LINE

43 STATION NO.	LOCATION
43	E. SQUANTUM ST.
44	W. SQUANTUM ST.
45	W. SQUANTUM ST.
46	HANCOCK ST.

TABLE VI-7
CORDON LINE B
WOLLASTON STATION

	ADT			INBOUND AM PEAK HOUR			
Station Location	1970	1971	% Change		1970	1971	% Change
34 Hancock St.	N. 9300	N. 7500	-19.4	(7-8)	769	629	-18.1
35 Newport Ave.	N. 5350	N. 6290	+17.6	(7-8)	611	1185	+94.4
36 Beale St.	W. 8550	W. 7020	-10.8	(8-9)	749	569	-29.9
37 Beale St.	E. 5050	E. 4050	-19.8	(8-9)	326	242	-25.8
41 Hancock St.	S. 8000	S. 7830	- 2.1	(11-12)	550	510	- 7.3
42 Newport Ave.	S. 3300	S. 4050	+40.9	(11-12)	238	310	+31.6
Total	39550	37940	- 4.2		3241	3435	+ 6.0

TABLE VI-8
CORDON LINE C
NORTH QUINCY STATION

	ADT			INBOUND AM PEAK HOUR			
Station Location	1970	1971	% Change		1970	1971	% Change
43 E. Squantum St.	W. 3650	W. 3690	+1.1	(8-9)	412	481	+14.8
44 W. Squantum St.	W. 7000	W. 6790	-3.0	(7-8)	579	489	-16.4
45 W. Squantum St.	E. 4750	E. 4520	+4.8	(7-8)	358	502	+40.2
46 Hancock St.	S. 9839	S. 9130	-7.2	(7-8)	514	585	-11.3
Total	25239	24130	-4.6		1863	2052	+10.1

Generally, Tables VI-6, VI-7, and VI-8 indicate that the local roads that were utilized by through traffic for access to Boston have experienced a decrease in ADT and peak hour traffic;

while the local roads that can be used primarily for access to the three MBTA stations have shown small increases in ADT, but significant increases in peak hour volumes.

The total Quincy Center Cordon Line A shows a slight increase in ADT and peak hour volume. However, the roads that can be used as access to the transit station experienced substantial increases in peak hour volume, while those that were previously used for through traffic purposes experienced a decline in peak hour periods, see Station 28.

This pattern is repeated in the cordon line data for both Wollaston and No. Quincy Stations. The most illustrative example of this occurance can be observed in the data concerning Hancock Street. Hancock Street, prior to the new rail rapid transit service, was used primarily by through traffic, and it had exhibited yearly increases in peak hour traffic volume. Three months after the Quincy Stations became operational, however, it experienced decreases in peak hour volume at stations 34 and 41, see Table VI-7. The sections of Hancock Street monitored by stations 34 and 41 were previously used by through traffic during the peak hours. However, station 46 which monitored southbound traffic towards No. Quincy Station exhibited an 11.4% increase in peak hour volume. Therefore, traffic demands on roads previously used by through traffic decreased, while those roads which could provide access to the transit stations increased, especially during the peak hours. This indicates that the Quincy Rapid Transit Stations are utilized by commuters in the immediate

environs of the stations. This fact, in conjunction with the opportunity for many people to walk to a transit station instead of driving into Boston, has reduced the peak hour traffic volumes on local roads once utilized for through traffic purposes.

C. BUSES

Buses, along with private cars, provided and continue to provide major transportation services in the South Shore Corridor. Prior to the completion of the South Shore Extension, MBTA buses served as feeder lines to the existing MBTA rail transit stations, in particular Mattapan, Ashmont and Fields Corner.

With the advent of rail rapid transit to Quincy Center the MBTA reorganized its bus routes in the south shore corridor, (see figure VI-C). In general, the three Quincy Stations, particularly Quincy Center, became the focus of feeder bus lines replacing Mattapan, Ashmont and Fields Corner Stations. Table VI-9 displays the impact, the new rail transit stations and bus route reorganization has had on bus ridership.

Table VI-9, part I, indicates that after the rail transit extension became operational, bus ridership in the south shore corridor decreased significantly, i.e., 37.1% during twenty-four hour periods, and 26.9% during the inbound (A.M.) peak hours. The following four factors can be considered the major reasons for much of the ridership decline:

1) The penetration of rail transit into the south shore corridor, and the location of the stations in densely

developed areas have made walking to the rail transit station a feasible alternative to feeder buses for many residents. Results from the 1972 MAPC-MBTA ridership survey of the south shore extension indicate that 32% of the rail transit riders walk to a transit station and that only 16% utilize feeder buses. These statistics are significant in that 39% of the rail transit riders surveyed used feeder buses prior to the rail transit extension.

2) The new rail transit stations have made kiss and ride opportunities available to more commuters. Thus, an increase in this mode of transportation to a transit station can result in a decrease in bus ridership.

3) Similar to number two, the new stations provided more park and ride opportunities. More importantly, however, the increased parking spaces are more easily accessible to south shore commuters than previously. Thus, some commuters may now park and ride instead of using a feeder bus, or driving into Boston.

4) The reorganization of the bus routes could have deprived some people of bus service, thus forcing a change in commuting methods.

Part II of Table VI-9 displays the changes in bus ridership developed areas have made walking to the rail transit station a feasible alternative to feeder buses for many residents. Results from the 1972 MAPC-CTPS ridership survey of the south shore extension indicate that 32% of the rail transit riders walk to a transit station and that only 14% utilize feeder buses. These statistics are significant in that 39% of the rail transit riders surveyed used feeder buses prior to the rail transit extension.

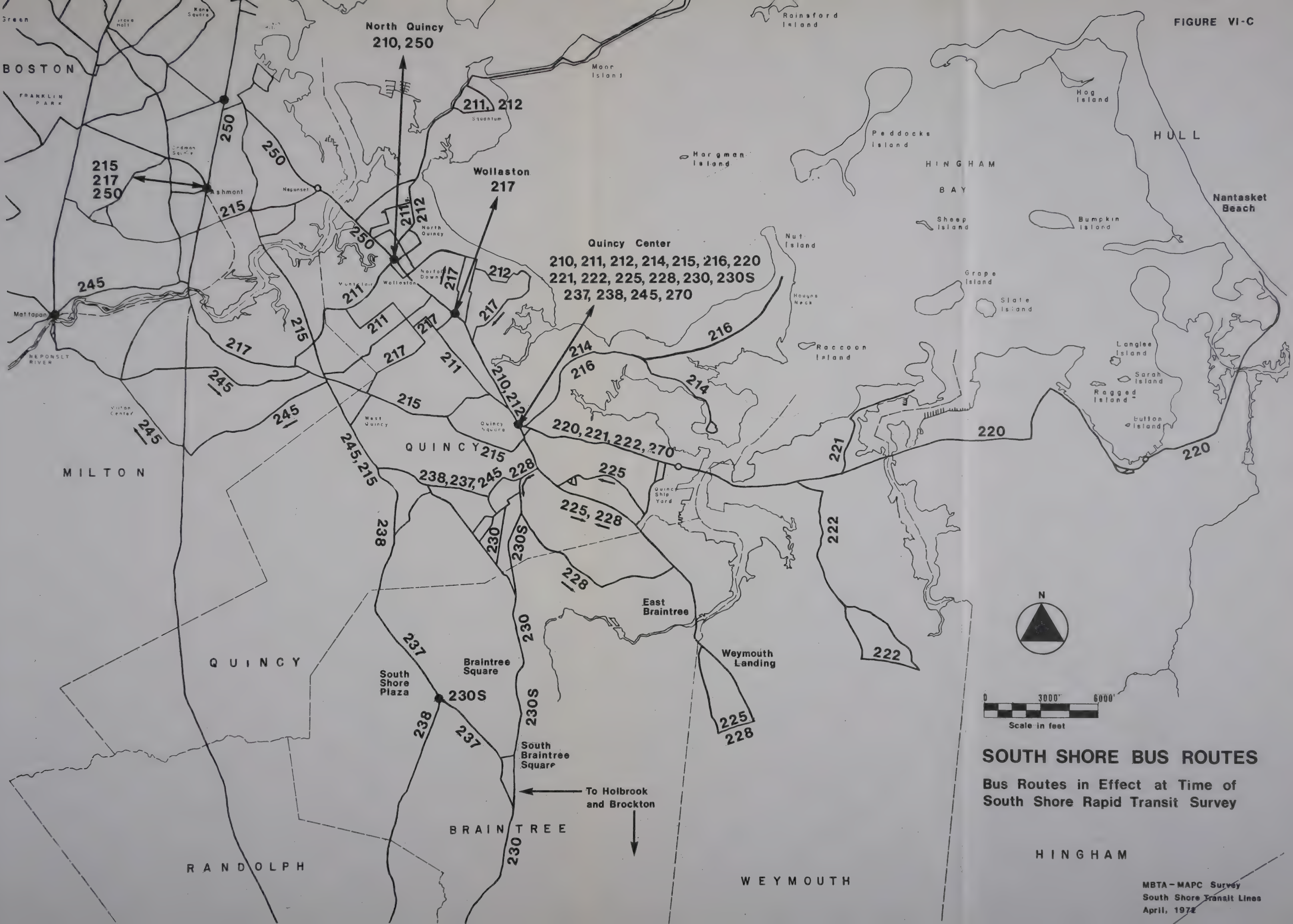
2) The new rail transit stations have made kiss and ride opportunities available to more commuters. Thus, an increase in this mode of transportation to a transit station can result in a decrease in bus ridership.

3) Similar to number two, the new stations provided more park and ride opportunities. More importantly, however, the increased parking spaces are more easily accessible to south shore commuters than previously. Thus, more commuters may now park and ride instead of using a feeder bus, or driving into Boston.

4) [illegible] some people of bus service, thus forcing a change in commuting methods.

Part II of Table VI-9 displays the changes in bus ridership

FIGURE VI-C



SOUTH SHORE BUS ROUTES

Bus Routes in Effect at Time of South Shore Rapid Transit Survey

MBTA – MAPC Survey
South Shore Transit Lines
April, 1972

North Quincy
210, 250
Wollaston
217
Quincy Center
210, 211, 212, 214, 215, 216, 220
221, 222, 225, 228, 230, 230S
237, 238, 245, 270
BOSTON
Franklin Park
Ashmont
Neponset
Mattapan
Neponset River
Milton Center
MILTON
QUINCY
West Quincy
Quincy Square
Squantum
North Quincy
Norfolk Downs
Montclair
Wollaston
Moon Island
Rainsford Island
Hangman Island
Peddocks Island
Hog Island
HULL
HINGHAM BAY
Sheep Island
Bumpkin Island
Nantasket Beach
Nut Island
Houghs Neck
Grape Island
Slate Island
Raccoon Island
Langlee Island
Sarah Island
Ragged Island
Button Island
Quincy Ship Yard
East Braintree
Weymouth Landing
South Shore Plaza
Braintree Square
South Braintree Square
To Holbrook and Brockton
BRAINTREE
RANDOLPH
WEYMOUTH
HINGHAM
N
0
3000'
6000'
Scale in feet
215
217
250
245
211, 212
211, 212
212
217
211
216
214
220
220, 221, 222, 270
221
222
225
225, 228
228
230
230S
237
238
238, 237, 245
245, 215
210, 212

TABLE VI-9
Change in Bus Ridership 1969-1971*

	April-May 1969	Nov.-Dec. 1971	% Change
I. Total System			
A. 24 Hrs.	23455	14384	-37.1
B. Morning peak (7-9A.M.)	5292	3868	-26.9
C. Evening peak (3-6P.M.)	7167	4308	-39.9
*Excluding Ashmont-Brockton Route 600 in 1969			
II. Quincy Only Routes			
A. 24 Hrs.	16676	6661	-60
B. Morning peak (7-9A.M.)	3861	1949	-49.5
C. Evening peak (3-6P.M.)	5020	1968	-60.8
III. Quincy - Braintree Routes			
A. 24 Hrs.	2332	1634	-29.9
B. Morning peak (7-9A.M.)	554	390	-29.6
C. Evening peak (3-6P.M.)	797	473	-40.6
IV. Quincy - Weymouth Routes			
A. 24 Hrs.	2395	2695	+12.5
B. Morning peak (7-9A.M.)	437	599	+37.1
C. Evening peak (3-6P.M.)	729	771	+ 5.8
V. Quincy - Hingham Route			
A. 24 Hrs.	1201	1452	+20.9
B. Morning peak (7-9A.M.)	146	231	+58.2
C. Evening peak (3-6P.M.)	390	496	+14.4

*Dial-a-Ride, A transportation Alternative for Commuting in the South Shore Corridor of Massachusetts. MIT Report June 1972 James Hogan

of the Quincy only routes (the figures are for 1969 and include routes between Quincy and Fields Corner and Ashmont Stations). It indicates that the Quincy bus ridership declined 60% during twenty-four hour periods and 49.5% during inbound (A.M.) peak hours. The magnitude of the decline in ridership for the Quincy bus routes is greater than that for the entire system. This fact indicates that the four points mentioned above, while applying to an area larger than Quincy, have had their greatest impact in Quincy. In fact, the walking to the station alternative is unique to Quincy. Therefore, it is not unexpected that Quincy has experienced the largest decline in bus ridership.

As shown in Part III of Table VI-9, Braintree's bus routes exhibited a 29.9% decrease over twenty-four hour periods and a 29.6% decrease during the inbound (A.M.) peak hours. The decline in Braintree bus riders is significant but it does not approach the magnitude of Quincy's decline since walking to the station is not feasible; and that park and ride and kiss and ride alternatives are less convenient for Braintree residents.

Weymouth, on the other hand, Table VI-9, Part IV, experienced increases in bus ridership, i.e., 12.5% during twenty-four hour periods and 37.1% during inbound (A.M.) peak hours. This trend is also evident for Hingham buses, Table VI-9, Part V, which increased 12.9% over twenty-four periods and 58.2% during inbound (A.M.) peak hours. Weymouth and Hingham bus ridership trends, therefore, run counter to the overall trend of the south shore

corridor. This seemingly reverse trend is related to the fact that alternatives to feeder buses (kiss and ride, park and ride) are not as convenient to commuters further away from the stations as they are to those close to the stations.

The information in Table VI-9, therefore, indicates that since the opening of the South Shore extension, there has been a decline in bus ridership in the South Shore, as a whole. The decline, however, is shown not to be a rejection of buses as a mode of travel, but rather the introduction of others more feasible mode of transportation, as previously described. The decline in bus ridership has occurred in a few communities, notably Quincy and Braintree, while it has actually increased in others. The increase in bus ridership is primarily due to the fact that, with the extension of the rail rapid transit system into the South Shore corridor and the reorganization of bus routes, communities where feasible feeder bus service did not previously exist now have the opportunity for feasible bus service.

The phenomenon of increasing bus ridership as one moves away from Quincy and Braintree, at first, seems to contradict the conclusions of Chapter V, Section F (Origins), which states that the predominant mode of travel to the transit stations from suburban communities outside Route 128, is by car. Both results, however, are valid and not contradicting. What has occurred is that with the opening of the South Shore Extension the feasibility of both cars and buses as modes of travel to transit stations has increased

for communities outside Route 128. The data, therefore, indicates that given existing conditions, cars are the primary mode of travel to the transit stations for the more distant and suburban communities but buses are now also feasible as shown by resulting increases of feeder bus riders from the presently "outlying communities".

With the proposed further extension of the South Shore line; it is probable that the relationships between modes of access to the transit extensions will vary for some communities. The exact relationship will depend on numerous and as yet undefined variables; i.e., highway access, parking capacities, parking fees, station design, bus routes, bus operating costs, density of areas served, etc. This study will not attempt to determine what types of accommodations should be provided for buses and cars. The study, however, based on existing data, concludes that there is a propensity to use a variety of alternative means of transportation to transit stations as one moves closer to the station and vice versa. The "proper" mix of parking and bus service must be determined as a result of investigations of those variables previously described. It cannot be determined by indescriminately overlaying existing data onto new service areas.

D. PARKING DEMANDS

In August of 1971, prior to the opening of the South Shore Extension, the MBTA conducted license plate surveys at Mattapan Line and Ashmont Line park and ride facilities. Surveys were later conducted at the three Quincy line park and ride facilities in

September 1971, shortly after the transit extension became operational. The surveys were conducted to determine the impacts the new stations would have on existing park and ride facilities in the South Shore corridor.

There were 1,410 license plate records of cars parked at the Mattapan Line and Ashmont Line lots which were matched with Registry records for location origins of these cars. There were 1,176 license plate records of cars parked at the Quincy Station lots were similarly matched with Registry records. These two sets of records were then compared to determine the number of cars diverted from the old to the new park-ride facilities by station and origin.

A total of 170 cars which had parked at the Mattapan and Ashmont Line lots were found to have been diverted to the new facilities. Thus 12% of the park and ride patrons formerly using the old facilities transferred to the new Quincy facilities. The large majority, 64%, of the diverted cars went to Quincy Center Station, while 21% transferred to Wollaston and 15% to North Quincy.

The origins of the 1970 diverted cars were dispersed over towns comprising the South Shore. However, the bulk of the diverted cars originated from Quincy (38%), Braintree (17%), and Weymouth (15%). Together these three towns accounted for 70% of the diverted cars. Thus the major shift in parking demand occurred for those towns closest to the new stations. This result is not unexpected since most of the "old" park and ride commuters (who were not [illegible] 1971, [illegible] ly affect the parking on [illegible]

lined. The survey [illegible] ore this [illegible] the [illegible] new station would have on existing park and ride facilities in [illegible] adjacent areas.

There were 5,410 license plate records of cars parked at the [illegible] Line and [illegible] lot which were matched with Registry records for location origins of the [illegible]. There were [illegible] license plate records of cars parked at [illegible] which were similarly matched with Registry records. These two sets of records were then compared to determine the number of cars shifting from the old to the new park-and-ride facilities by station and origin.

A total of 170 cars which had parked at the [illegible] and [illegible] lots were found to have been diverted to [illegible] Center. Thus 10% of the park and ride patrons formerly using the [illegible] facilities transferred to the new [illegible]. The vast majority, 64%, of the diverted cars were [illegible], while 21% transferred to Wollaston and 15% to North Quincy.

The origins of the [illegible] diverted cars were dispersed over towns comprising the South Shore. However, the bulk of the diverted cars originated from Quincy ([illegible]%), Braintree ([illegible]%), and Weymouth ([illegible]%). Together these three towns accounted for [illegible]% of the diverted [illegible].

[illegible] the major shift in parking demand occurred for those [illegible]

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diverted) were from the south shore towns closest to Boston and the older red line park and ride facilities.

The largest diversion occurred from the Columbia-Morrissey Blvd. Lot (62%) followed by the Columbia Road lot (13%). The diversion at the Columbia-Morrissey Blvd. lot, however, represented only 24% of that lots capacity. This fact is supplemented by data that the 170 diverted cars represent only 15% of the cars parked at the new Quincy park and ride facilities.

Thus one of the important findings of the survey is that the new park and ride facilities in Quincy are attracting a predominently new market.

E. THE "WRONG WAY" BUS

In May 1971, the Massachusetts Department of Public Works instituted an exclusive bus lane demonstration experiment on the Southeast-Route 3 Expressway in an attempt to offer relief and obtain greater effectiveness of the highway. This experiment, popularly entitled the "wrong way bus", reserved one southbound expressway lane in the morning peak period for northbound bus service into Downtown Boston and reversed the procedure for outbound trips in the evening peak period. Four private bus carriers participated in this experiment and operated 82 inbound trips over the reversed lane.

In September 1971, the evening outbound reversed lane operation was discontinued since a DPW report entitled The Exclusive Bus Lane

operation was marginal from both the economic and time savings point of view. In the same month, the South Shore Extension began operation. In the winter months of 1971 and 1972 the bus service was entirely suspended. Finally, because of safety considerations, the experiment was halted.

Considering the numerous variables, actual estimates of private carrier bus riders diverted by the extension were not attempted. Analysis of the private bus impact on the extension; i.e., ridership diverted from the extension was also not attempted.

The reader is directed to the MDPW report, "The Exclusive Bus Lane Demonstration", for further information on this subject.

CHAPTER VII

ECONOMIC IMPACTS

In today's highly mobile society, access is of vital importance to the economic health and growth of a city or region. The South Shore Rapid Transit Extension introduced a new mode of access to and from Quincy, which provides for the movement of large numbers of people. The new transit facility has the potential for significantly altering the economic characteristics of Quincy and the surrounding area. This chapter therefore, discusses regional economic impacts related to the transit extension by focusing on the economy of Quincy, since all of the three stations are located in Quincy.

Historically, manufacturing has been the primary source of employment in Quincy. By virtue of the General Dynamics Fore River Shipyards, manufacturing remains the largest labor force activity in Quincy's economy, followed by wholesale and retail trade. Table VII-1 illustrates the economic characteristics of Quincy in 1971.

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[illegible]

[illegible]

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Table VII-1

Components of Quincy's Economy - 1971

Industry	# of Firms	Annual Payroll	% of Total Payroll	Ave. Employment	% of Total Employment
Agriculture	4	$179,020	0.08	22	0.07
Mining	1	$79,838	0.03	10	0.03
Construction	193	$16,731,493	7.03	1,487	4.78
Manufacturing	120	$118,511,624	49.80	12,225	39.28
Transportation, Communication and Utilities	49	$ 23,091,505	9.70	2,814	9.04
Wholesale and Retail Trade	554	$51,289,382	21.55	9,784	31.44
Finance Insurance and Real Estate	84	$11,692,272	4.91	1,613	5.18
Services	429	$16,414,491	6.90	3,113	10.18
Totals	1,433	$237,989,625	100.0	31,124	100.0

Table VII-1 indicates, as stated, that manufacturing is the largest component in Quincy's economy comprising 39.28% of the work force and accounting for 49.80% of the total annual payroll. Ship and boat building and repairs, which is centered at the Fore River Shipyards, employs 55.17% of the manufacturing labor force. General industrial machinery and equipment, newspapers, publishing and printing, soap detergents and cosmetics, in that order, are the next highest employers of manufacturing labor. Combined, however, they employ only 17.88% of the manufacturing labor force. Thus shipbuilding and repair is the dominant factor in the manufacturing sector of Quincy's economy, and fluctuations in this industry can and have had major impacts on the entire economy of Quincy.

Wholesale and retail trade employs 31.44% of the total work force. While this figure is second only to manufacturing (39.28%), it generates only 21.55% of the total annual payroll, which is less than half of the payroll generated by the manufacturing industries.

Agriculture and mining, as shown in Table VII-1, represent minute portions of Quincy's economy and are of little consequence. Construction, transportation, communications and utilities, finance insurance and real estate, and service industries each represent no more than 10% of the work force or total payroll. Quincy, therefore, while it has a measure of diversification in its economy, is still dependent on manufacturing in general, and shipbuilding and repairs in particular for its economic well-being.

Table VII-1 illustrated the 1971 Quincy economy, while Table VII-2 shows the performance of Quincy's economy from 1967 to 1971.

Table VII-2

Quincy's Economy 1967-1971

	1967	1968	1969	1970	1971	% Change
Total Annual Payroll (000's)	$212,037.9	218,166.8	227,654.0	233,873.7	237,989.6	12.24
Average Annual Payroll	$6,222	6,426	6,801	7,213	7,646	22.89
No. of Establishments	1,507	1,517	1,468	1,447	1,433	-4.91
Total Employment	34,077	33,951	33,473	32,424	31,124	-8.67
Agriculture & Forest Ind.	22	32	33	25	22	0.0
Mining	8	9	9	10	10	25.0
Construction	1,692	1,660	1,659	1,557	1,487	-12.12
Manufacture	16,641	15,749	14,643	14,082	12,281	-26.20
Transp. Communication & Utilities	1,632	1,313	1,508	1,566	2,814	72.43
Wholesale & Retail Trade	10,318	10,873	10,874	10,368	9,784	-5.18
Finance, Insurance & Real Estate	1,331	1,389	1,452	1,516	1,613	21.19
Services	2,434	2,927	3,306	3,300	3,113	21.81

From 1967 to 1971, Quincy experienced limited economic growth. The total annual payroll did increase by 12.24% but total employment actually decreased 8.67%. Thus during this five year period, Quincy lost one of every twelve jobs. Of major importance was the 26.20% decline in manufacturing jobs, which was fueled by a decline in activity at the Fore River Shipyeards. The second most significant sector of the economy, wholesale and retail trade, had 5.18% fewer jobs in 1971 than in 1967. Construction, the third most important sector, also contributed to the total employment decline, by reducing employment 12.12%. However, the transportation, communication and utilities sector, (paced by 81% increase from 1970 to 1971 in the television communications industry representing 1348 jobs) increased employment by 72.43%. Finance insurance and real estate companies were employing 21.19% more people in 1971 than in 1967 and the service industries increased employment by 21.81%.

Therefore, the historic mainstays of Quincy's economy experienced a relative decline in importance. Other segments of the economy like finance, insurance and real estate and the service industries (though still not as significant as trade or manufacture) are increasing by more than twice the rate of the economy in general. These industries are becoming more significant and could represent future growth areas of the economy.

It should be noted, however, that the decline in manufacturing, Quincy's principal industry, is not a trend unique to Quincy.

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From 1967 to 1972, Massachusetts, for a variety of reasons, lost almost 100,000 manufacturing jobs, a decline of 14%. The state, however, during the same period increased trade and construction employment and employment in all other catagories. Quincy, therefore, when compared to the state is similar only in its decline in manufacturing. In general, the growth of Quincy's economy from 1967 to 1971 lagged behind the growth of the state economy.

Therefore, in September 1971, when rail rapid transit commenced operations to Quincy Center, the economy in Quincy could be described as sluggish and in the process of change. This change is not unlike those changes that have occurred in highly developed cities, especially core cities, throughout the nation. The major indicators are a steady loss in manufacturing jobs and a stagnation or decline in retail trade related employment.

The factors governing this change are usually poor access, obsolesence of the physical plant, a lack of suitable expansion space and a shift in market location due to population shifts. Thus on a national scale, manufacturing and retail jobs have been moving to suburban areas (industrial parks and regional shopping centers) where there is ample and convenient highway access, space for expansion, and proximity to the expanding suburban and automobile oriented population. While older cities have lost manufacturing and trade employment, some have experienced increases in nonmanufacturing and trade employment such as the service industries. Problems arise, however, when there is a lag in replacing

[illegible]

almost 100,000 manufacturing jobs, a decline of 15%. The state [illegible], [illegible] the same period increased [illegible] and [illegible] employment in all other categories. [illegible] the state is similar only to the decline in [illegible]. [illegible], [illegible] of [illegible] 1970 [illegible] in the [illegible].

Therefore, in September 1970 [illegible] staff began [illegible] of [illegible] County, [illegible] in [illegible] as [illegible] and in the [illegible]. The [illegible] is to outline those changes that have occurred [illegible] the major [illegible] and a steady loss in manufacturing [illegible] or decline in metal trade related employment.

[illegible] of the physical plant, a lack of suitable [illegible] and a shift in market location due to [illegible] a national scale, manufacturing [illegible] moving to suburban areas (industrial parks and [illegible]) where there is [illegible] highway access, [illegible], and proximity to the expanding suburban and [illegible] population. While older cities have lost [illegible], [illegible] have experienced increases in [illegible] the lost manufacturing jobs, or when the existing transportation system cannot support labor intensive office work, or service industries.

In the case of Quincy, the new rail transit extension has provided the city with the opportunity to alleviate the problems associated with an economy dominated by manufacturing evolving towards a more balanced economic base. The most notable beneficial economic impact to date has been the decision of the State Street Bank and Trust Company to locate a new 100 million dollar office complex near North Quincy Station. Bank officials determined that they needed considerable acreage for new office facilities and were originally studying a site in Braintree.

One of the major factors which led the State Street Bank to select the North Quincy site, was the access that the new transit station could provide to the labor pool needed by the bank. The labor pool in question, was young, mostly female and possessing office and business skills. According to an independent survey commissioned by the bank, rapid transit service would be very important in attracting this type of employee. Therefore, as Quincy's economy continues to move away from manufacturing employment, the rail transit extension can provide access to labor pools for finance and service related industries. Thus, the rail transit service is economically valuable to Quincy since it is attracting and supporting those firms which can replace the jobs lost in the manufacturing sector of the economy.

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[illegible] interest [illegible] potential [illegible] provided [illegible] opportunity to alleviate [illegible] associated with [illegible] economy dominated by [illegible] underlying conditions [illegible] enhanced economic [illegible]. The [illegible] to [illegible] the decision [illegible] the state government and [illegible] County to [illegible] a [illegible] meant that they [illegible] comfortably housing [illegible] families [illegible] a site in [illegible].

One of the major factors which led the state [illegible] the [illegible] County site, [illegible] the new [illegible] would provide to the labor [illegible] by the [illegible] in question, was [illegible] mostly [illegible] current [illegible] skills. [illegible] by the [illegible] would [illegible] the type of employees. [illegible] to make [illegible] their [illegible] economic expansion [illegible] provide [illegible] and service related industries. [illegible] which [illegible] growth [illegible].

Relatively low land costs, proper zoning, and the availability of rail transit which provides access to needed labor pools has resulted in other firms following the State Street Bank into the North Quincy area. The Kemper Insurance Company has built an office complex to serve its Greater Boston operation; Jordan Marsh is building new administrative offices, a warehouse and a bakery; and Otis Elevator has also constructed office facilities on Hancock Street near the new North Quincy MBTA station.

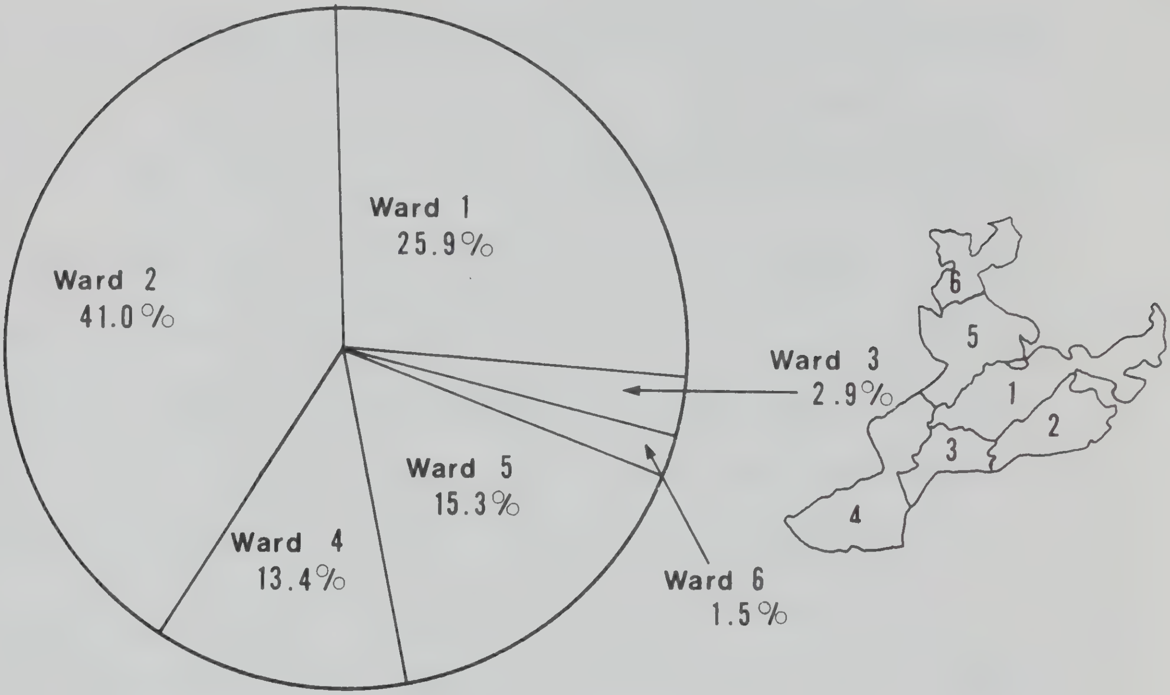
The impact on the North Quincy area, by all this new development, is reflected in the type and scale of development that has occurred in the area. From 1969 to mid-1972, 58.3% of all construction activity (in terms of value) in Quincy has occurred in Ward 6, which is the North Quincy area. Further defined, fully 87.3% of all business and commercial development that has occurred in Quincy from 1969 to mid- 1972 has been located in Ward 6. Conversely, only 1.5% of all residential activity has occurred in Ward 6, see Figure VII-A. These figures, emphatically, indicate that North Quincy is developing into a significant business and financial center. The new developments will eventually supply approximately 4000 new jobs, bring new revenues into the city, revitilize an older portion of the city, and provide Quincy with a more diversified, thus more stable, economic base. To date, therefore, North Quincy is the area where most of the rail transit related economic benefits have occurred.

Quincy Center and Wollaston have also experienced economic impacts. However, both areas are highly developed and have long

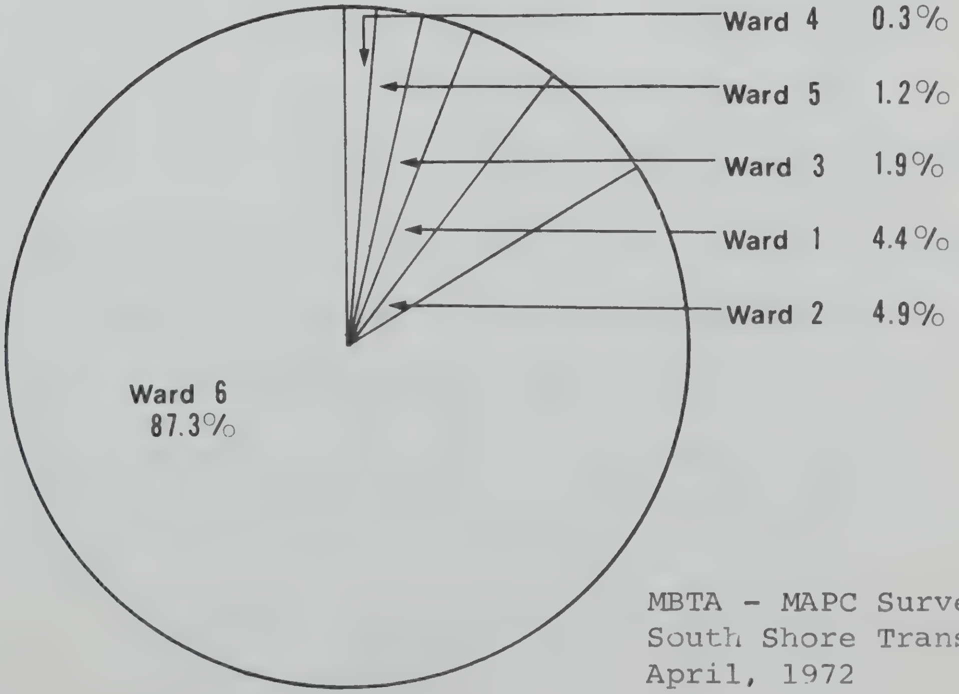
Figure VII-A

PERCENT OF DEVELOPMENT IN QUINCY BY WARD FROM 1969-1972

Percent of Residential Development



Percent of Commercial and Business Development



MBTA - MAPC Survey
South Shore Transit Line
April, 1972

existing land use traditions. Thus economic impacts (it should be noted that analysis had indicated that no significant adverse economic impacts have occurred) have not occurred as rapidly or as dramatically as those associated with North Quincy.

Wollaston is the most residential of all the station locations, and the commercial development that does exist is locally oriented. To date, there has been little development that can be linked directly to the arrival of rail transit service. Most of the area adjacent to the station, therefore, has not experienced significant new development or changes in land use.

From 1969-1972 only 1.2% of commercial development occurring in Quincy, was located in Ward 5, an area that contains the Wollaston Station and its immediate environs. Also, only 15.3% of new residential development occurred in Ward 5 from 1969-1972, compared to 41% in Ward 2 which is in South Quincy. Considering that the new zoning law protects much of the existing residential development, it is probable that only the vacant and poorly utilized lots (of which there are few) can be developed in a manner similar to the business-commercial development occurring in North Quincy. Therefore, in the short term, there have been little tangible land use changes in this area of Quincy. The new MBTA station, however, provides a new mode of transportation for the residents of this area. Pervious transit [illegible] land use regulations. [illegible] is noted [illegible] that [illegible] regulations [illegible] generally [illegible] have been [illegible] as [illegible] these areas [illegible].

[illegible] is the most neglected of all the [illegible] commercial development that [illegible] in the [illegible] Band 5 [illegible] will remain east [illegible]. Many [illegible] in the [illegible] development or [illegible].

[illegible] Quincy [illegible] in Band 5, [illegible] between [illegible] of new residential development occurred in Band 4 [illegible] compared to the [illegible] 2 [illegible] the new housing [illegible] of the [illegible] lots (of which there are [illegible]) [illegible] in North Quincy. [illegible] in this area of Quincy. [illegible] residents.

studies[1] have shown that the increase in accessibility due to rail transit facilities results in significant appreciation for residential properties located in the general vicinity of the transit station. Thus, in the long term, the new facility can have a beneficial economic impact on the Wollaston area by increasing property values and therefore, discouraging the continuance of marginal uses. To date, however, no studies have been made to determine the extent of transit on adjacent residential areas in Quincy. Spectacular development such as that occurring in North Quincy has not occurred in the Wollaston area, but small scale development and improvement of existing development is highly probable.

Quincy Square is similar to Wollaston in that it has extensive and firmly rooted land uses, i.e., business, commercial, and high density residential uses. Quincy Square is the city's most heavily developed area. The economic life of the community depends heavily on maintaining the vitality of this center of employment, government and transportation.

Ward 1 in Quincy contains Quincy Square and environs, and although it is a densely developed area, it accounted for 25.9% of all residential development in Quincy (in terms of value) from 1967 to mid 1972, see Figure VII-A. Most of the new

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[1] Regional Science Department, Univ. of Pennsylvania: Impact of Rapid Transit on Suburban Residential Property Values and Land Development. 1971.

development has been medium to high density multi-family as typified by the apartment complexes west of the new station on Upland Road. To date, the most visible economic impact to the Quincy Square area is the re-introduction of multi -family and apartment residential uses. This development creates a potential "local market" for the central business district, and the possibility of reviving the decline in retail activity in Quincy Square.

The new transit facilities can have adverse as well as beneficial economic impacts on the retail sector of Quincy's economy. It will provide a new mode of access to the Quincy CBD, thus increasing the potential market of the Quincy CBD, and the new station will be able to support intensive commercial uses if they develop. However, a 1970 Harvard Business School study[2] indicated that "by providing cheap, rapid and convenient transportation to the retail core of Boston, the MBTA will make competition more intense for the Quincy CBD retail stores. The brunt of the competition will be borne mainly by the apparel and small appliance stores because of the ease with which their goods can be carried by subway commuters". The area has historically been isolated from the major flows of traffic on the south shore since the Quincy CBD is not accessible by development has been, generally, [illegible] typified by the apartment [illegible] [illegible] in the [illegible] residential areas. This development [illegible] and the possibility [illegible] decline in retail [illegible]

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[2] The Harvard Business School, Report on the Effect of the MBTA Extension on the City of Quincy, August 1970.

The [illegible] facilities [illegible] have [illegible] as well as [illegible] on the [illegible] It will provide a [illegible] of [illegible] to the [illegible] the [illegible] of the [illegible], and the [illegible] will be [illegible] However, [illegible] transportation to the central core of Boston; the [illegible] The [illegible] of the competition will be [illegible] by the [illegible] small [illegible] stores because of the [illegible] with which [illegible] can be [illegible] historically been [illegible] from the major [illegible] of [illegible]

[illegible]

direct express highway connections. A proposal to use Newport Avenue as a connection to the Routes 3 and 128 interchange has been discussed. If this connector were constructed it would provide the Quincy CBD with good automobile access to supplement the existing transit access. Good automobile access is vital to the Quincy CBD's economic well being. To illustrate this fact, Table VII-3 taken from the Quincy Master Plan, shows the heavy dependence the Quincy CBD had on the market from the surrounding areas, prior to the completion of South Shore Plaza (located adjacent to Route 128).

Table VII-3

Origin of Quincy CBD Shopper, 1964

Town	Percent
Quincy	34%
Weymouth	13%
Braintree	9%
Other South Shore	21%
Boston	10.6%
Other	12.4%
Total	100.0%

66% of the CBD business prior to South Shore Plaza was from non-residents. It is not surprising that when South Shore Plaza, with its convenient access, came into existence, the Quincy CBD experienced a decline in retail sales of 6 million dollars the first year. If Quincy's retail business is to

compete effectively, it must have adequate automobile access. Transit facilities have not alone been sufficient to reverse declining retail trade trends in Quincy Center.

Data gathered from the April, 1972 ridership survey of the South Shore extension indicates that only 4% of the ridership travel to Quincy Center during the hours retail establishments are usually open for business. Thus, hopes that the transit extension in its present form can revive retail trade in Quincy Square are not well founded; since only a small percentage of the riders make Quincy Center their destination point during store hours. Also, of the 4% who traveled to Quincy Center, (approximately 3% of the 4% travel to Quincy Center for shopping purposes, 80% of the 4% travel to Quincy Center for Work purposes). The trains are not bringing retail shoppers to Quincy Square in any great numbers, while at the same time they make the large retail core of Boston even more accessible to Quincy residents. It should be noted, however, that Quincy Center is a node for bus service, and this fact may have benefits for retail stores in the CBD.

Considering recent trends in retail marketing and sales it appears that Quincy Center cannot compete with the South Shore Plaza and downtown Boston, as a regional retail center. Similarly, competition with the State Street Bank complex for insurance-banking land uses does not appear promising.

A Harvard Business School Study in 1970 said that "the CBD is most attractive to government oriented business, insurance companies and consumer businesses and services..." Transit can support the above mentioned commercial and business and government functions, and if Quincy decides to concentrate on these types of activity for the CBD, rail transit can be of benefit. Also as stated, transit has helped in the development of new high density residential complexes which have provided local markets and new construction to bolster the local economy. However, the local markets and transit riders coming to Quincy Square cannot wholly reverse the retail decline due to poor regional automobile access and lack of expansion space available within the Quincy CBD.

The economic impact on Quincy Square, therefore, has not been as impressive as that in North Quincy. However, the value of transit is not to be understated since it can help stabilize conditions by adequately supporting those activities for which the Quincy Square is most suitable.

Also, if the present transit service is extended beyond Quincy Square to South Quincy and Braintree (and accompanying Quincy arterial is constructed) Quincy Square will become more economically viable. With South Quincy or Braintree as the terminal station (as assuming easy access from major highways in the region) many commuters who now use Quincy Center's parking facility will be diverted to South Quincy or Braintree

parking facilities. This will have two short term impacts. First, through traffic in Quincy Square now associated with park and ride demand will decline. This will make business and institutional areas more accessible to customers, since there will be fewer vehicles and related traffic problems. Second, the diversion of commuters will result in a decrease in parking demands. Therefore, more parking spaces will be available for business purposes, this also will improve the economic viability of Quincy Square.

In the long term, therefore, the decrease in through traffic, and parking demands will enhance the economic climate of Quincy Square.

In conclusion, the economy of Quincy is experiencing a change in the structure of its economic base; from one dominated by manufacturing to a more balanced economy where service industries, finance and insurance industries are the new growth industries. Rail rapid transit by virtue of its ability to support intensive land uses near stations and the access it provides to the labor pool necessary in the finance and insurance industries is making the transition to a more balanced economic base, a less disruptive experience for Quincy.

Transit, however, has not, to date, revitalized retail trade in Quincy; since it is unable to offset other barriers to a revival of retail trade, i.e., poor automobile access from major South Shore arterials, obsolete retail facilities, and

lack of expansion space. What retail benefits that has or may occur can be attributed to the increased number of bus routes focusing on Quincy Center Station. Similarly, the transit service has had little effect on the manufacturing climate, which is a microcosm of a state-wide phenomenon.

The new transit facilities are an economic benefit to Quincy. They have introduced new jobs which mean more taxes and more construction for the city. The transit service has not and probably cannot to any great degree restore the historic economic base of Quincy, but it has aided in the establishment of a new economic base, which without transit service may have been long delayed.

CHAPTER VIII

LAND USE IMPACTS

THE NEW ZONING ORDINANCE

Land Use policies and procedures will play a major role in determining how effectively Quincy can utilize the transit extension for continued economic benefit. The following pages discuss the impacts the new transit system has had, and may have, on land use in Quincy; and what the impacts mean in terms of the city's social and economic characteristics.

During the planning and construction of the transit extension, Quincy city officials determined that Quincy would experience increasing pressures to grow as a result of the new service. To accommodate the anticipated growth, and to maximize the potential economic benefits to be derived, the City of Quincy on March 23, 1971 approved a new zoning ordinance. The new ordinance established eleven land use catagories, see Table VIII-1.

Table VIII-1

Zoning Districts, Quincy, Mass.

Residence A	Single Family
Residence B	Multi-Family, Low Density
Residence C	Multi-Family, Medium Density
Residence D	Multi-Family, High Density
Business A	Local Business
Business B	General Business
Business C	Central Business
Industrial A	Light Industry
Industrial B	Heavy Industry
Planned Unit Development	Comprehensive Development of Large Land Parcels
Open Space	Public Parks and Playgrounds

The completed zoning ordinance and map reflected an attempt to provide zoned areas that would compliment the anticipated transit oriented land use impacts. Experience in other cities[3] indicated that transit stations located at major street intersections stimulated intensive land use within approximately 1500 feet of the station. Within this radius there are priorities. Professional services and retail establishments are most often located nearest the station because they depend heavily on good access provided by roads and transit systems. Apartments can occupy an area adjacent to the stations but are customarily further away than commercial establishments. Single family and low density multi-family units usually are furthest away from the station location.

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3) Toronto Department of Planning, Metropolitan Transit Report. Young Street Extension.

Therefore, Quincy in preparing for the commencement of transit services, zoned most of the land around the three stations as "central business" (which allows the maximum flexibility in business development). The other areas within 1500 feet of the stations but beyond the business area were zoned for multi-family development. It should be noted, however, that existing and stable low density residential areas within 1500 feet of the station were zoned low density multi-family and single family; thereby, protecting them from encroachment by business and high density residential development; see Figure VIII-A.

The new ordinance, however, did not necessarily intend to change the land use characteristics of an area because of the impending transit system. For example, Quincy Center and the area adjacent to Wollaston Station were business and commercial areas prior to the existence of rail rapid transit in Quincy; and they were zoned for this type of activity. In these areas the new zoning ordinance modified the boundaries of zoned districts in an effort to accommodate the new transit line, but it did not attempt to completely change the land use characteristics.

The impacts which were expected, and to some extent have already occurred, were those mainly related to the redevelopment and rejuvenation of existing land uses. This aspect of transit related land use impacts can best be observed in Quincy Center where new commercial parking facilities were completed in 1972, and new apartment complexes west of the station have been

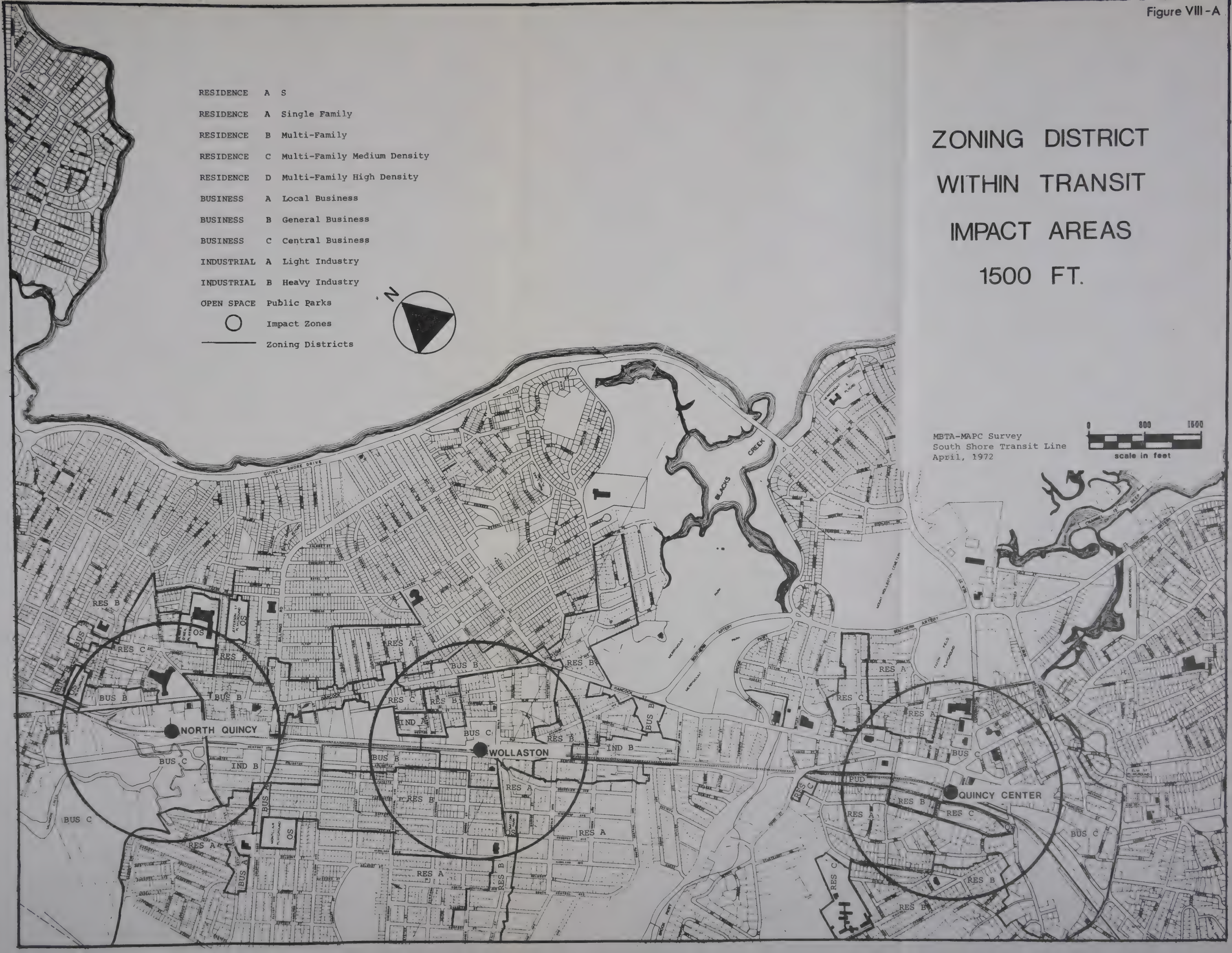
constructed. Additional developmental proposals are expected in the future which may change other aspects of Quincy Center.

NORTH QUINCY

North Quincy has experienced almost a complete change in land use patterns due to the transit extension and the new zoning ordinance. The Montclair Marsh-Neponset River Basin north and west of the station was rezoned for central business, see Figure VIII-A. The location of a transit station in this area accomodating large numbers of commuters plus the rezoning of the area has allowed the State Street Bank and Trust Company to develop a 100 million dollar project which will include a computer center, office towers, apartment buildings and supportive retail stores. The State Street Bank complex has had and will continue to have a great impact on the adjacent area. It will provide a quality standard for the North Quincy Area and drive land values up. Competition will cause marginal land uses to become uneconomical, thus changes in land use as allowed by the zoning law are probable. The best example of State Street's impact, is the number of other firms that have shown interest in the North Quincy area, i.e., Kemper Insurance, Jordan Marsh and Otis Elevator. North Quincy has been changed from undeveloped and marginal commercial uses to the finance and service industry center of Quincy.

For the future, North Quincy will continue to feel pressures for changes in land use. The area northwest of the station

Figure VIII-A


RESIDENCE A S
RESIDENCE A Single Family
RESIDENCE B Multi-Family
RESIDENCE C Multi-Family Medium Density
RESIDENCE D Multi-Family High Density
BUSINESS A Local Business
BUSINESS B General Business
BUSINESS C Central Business
INDUSTRIAL A Light Industry
INDUSTRIAL B Heavy Industry
OPEN SPACE Public Parks
○ Impact Zones
Zoning Districts
N
0
800
1600
scale in feet
QUINCY SHORE DRIVE
BLACKS CREEK
SOUTHERN ARTERY
HANCOCK ST
NORTH QUINCY
WOLLASTON
QUINCY CENTER
RES A
RES B
RES C
BUS A
BUS B
BUS C
IND A
IND B
OS
PUD

ZONING DISTRICT WITHIN TRANSIT IMPACT AREAS 1500 FT.

MBTA-MAPC Survey
South Shore Transit Line
April, 1972

experienced rapid change basically because it was vacant land, other areas which are developed will change land uses more slowly and in a less dramatic fashion. Southwest of the station(within the 1500 foot radius), however, is a two block residential area, see Figure VIII-A. This area has excellent access to the Station, land valuation are relatively low, it is bound by major arterials. With such a unique combination of transit and street accessibility, market potential is excellent. Given that the present land use, low density residential, is uneconomical and that the new zoning ordinance has zoned part of this area commercial and part industrial, it is highly probable that this a rea will experience a change in land use from residential to commercial - industrial.

Similar conditions and pressures exist northeast of North Quincy Station. Presently the area is a low to medium density residential area, with some business- industrial uses, i.e., a construction equipment storage area. The area has been zoned Residential C or high density residential. Considering the pressures exerted by the transit station, the State Street South Complex and the existence of zoning that allows high density development, it is probable that this area may experience pressures for apartment house development in the future, thus changing the character and land use of the existing neighborhood.

To the southwest there is an existing business area which was zoned for business in the new ordinance. Given the pressures for quality development due to the State Street South Complex,

this area may experience an upgrading of commercial activity, but the essential land use character of the area will remain. Also in this sector is a stable medium density residential area that is served by a variety of nearby community services, i.e., schools, parks, and churches. This area has been zoned Residence B or medium density multi-family. This zoning corresponds closely to existing neighborhood residential densities. Given the zoning and the stability of this area, it will probably remain essentially intact as medium density residential area.

WOLLASTON

The area surrounding Wollaston Station is predominately residential, with supportive local shopping areas. Most of the residential neighborhoods are well maintained and serviced by community facilities. The new ordinance zoned most of these areas, residential A and B, which to date has aided in maintaining the character of these neighborhoods. In some respects the introduction of a transit station has made the area a more desirable residential neighborhood, due to the increased access to Boston.

The existing business area adjacent to the station has been zoned general business in the new ordinance. The area that can be utilized for business purposes was expanded with acceptance of the new ordinance. The Wollaston business area is automobile oriented. The business area is a local shopping center, a characteristic which is desirable and should be maintained. If the surrounding residential area remains intact,

it is probable that the Wollaston business area will maintain its local character (to date this has been the case). Therefore, intensive commercial land uses which can be developed near transit stations have not occurred to any significant degree near Wollaston Station. The only area which may experience transit related commercial development, in the future, is that area south of Beale Street which is vacant or underutilized. Therefore, the Wollaston Station area has experienced the least amount of land use changes. This phenomenon is basically due to the stability of and the need for the present uses. Except for a few areas adjacent to the station, it is probable that there will be little pressure for intensive transit related commercial-business use.

QUINCY SQUARE

Quincy Center Station is located in Quincy Square, the city's most heavily developed area. The new ordinance zoned large portions of this area as Central Business, see Figure VIII-A, which allows the greatest flexibility in business development. The residential areas with the 1500 foot impact zone were zoned for medium and high density residential use. Thus while a unique characteristic of the Wollaston area is its extensive low to medium residential development, Quincy Center is characterized by its lack of such development. Similarly, Quincy Square is the economic center of the city and not a local shopping area. Quincy Square has some of the highest land values

[illegible] the Wollaston [illegible]
[illegible] area, intensive commercial land uses which can be developed near transit stations have not occurred to any significant degree near Wollaston Station. The only area which may experience transit related commercial development, in the future, is that area south of Beale Street which is vacant or underutilized. Therefore, the Wollaston Station area has experienced the least amount of land use changes. This phenomenon is basically due to the stability of and the need for the present uses. Except for a few areas adjacent to the station, it is probable that there will be little pressure for intensive transit related commercial-business use.

[illegible]

Quincy Center station is located in Quincy Square, the city's most heavily developed area. The new ordinance zoned large portions of this area as Central Business, see Figure VIII-4, which allows the greatest flexibility in business development. [illegible] unlike characteristic of the Wollaston area is its extensive low to medium residential development, Quincy Center is characterized by [illegible]. Quincy Square is the economic center of the city and not a local [illegible] area. Quincy Square has some of the highest land values in the city and the most intensive land utilization. As stated, transit services can support intensive commercial and residential land use. Since they exist in Quincy Square, the new transit facility has not changed land use characteristics in Quincy Square as it did in North Quincy, but it has resulted in better transportation facilities to support what presently exists. Thus in terms of commercial land use impacts the transit service to date has not induced major changes. However, for the future, the presence of transit and its possible future expansion should help to rejuvenate existing commercial uses and make more feasible future commercial development.

The areas in the Quincy Square impact zone which have had and may continue to have noticeable changes in land use are those areas zoned for residential use. If Quincy Square is economically benefitted over the long term by transit, this will tend to drive land values upward. As a result, only the more intensive residential land uses (like those already occurring on Upland Road west of the station) will be feasible. Those areas which are now developed to low and medium densities, but are zoned for medium to high densities will probably experience a change from typical neighborhood densities (in Quincy) to densities related to apartment house developments. This change will irretrievably alter the character of the areas in question.

In the city and the most intensive [illegible]. [illegible] transit services can support intensive commercial and residential land use. Since they exist in Quincy Square, the new transit facility has not changed land use characteristics in Quincy Square as it did in North Quincy, but it has resulted in better transportation facilities to support what presently exists. Thus in terms of commercial land use impacts the transit service to date has not induced major changes. However, for the future, the presence of transit and its possible future expansion should help to rejuvenate existing commercial uses and make more feasible future commercial development.

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SUMMARY

The new transit service has and will result in major changes in land use for the North Quincy area. It will have the least land use impacts on the Wollaston Station area. As for Quincy Square, the new facility will bolster the existing land uses and probably increase residential densities. The three stations will serve three different land use areas, i.e., North Quincy Station will support the new finance and service industry center of Quincy; Wollaston will continue to serve a residential neighborhood of low to medium density and possibly add a more intensive commercial dimension to a local shopping area; and Quincy Center Station will support the retail and institutional center of the city and stimulate the development of high density residential complexes.

Future development within the defined impact zone will be related to transit stations, in that, the adjoining areas of the three stations have developed or will develop a roughly concentric land use pattern consisting of business and commercial uses closest to the station, followed by medium to high density multi-family development, and finally low density residential neighborhoods.

The new transit service has [illegible] result in major [illegible] land use for the North Bridge area. It will have the [illegible] [illegible] [illegible] and generally increase residential densities. The [illegible] stations will cause other different land use effects. [illegible] North Valley Station will support the new [illegible] and business [illegible] will continue to [illegible] residential development of [illegible] density and [illegible] more intense commercial development in a [illegible] and [illegible] Station will support the retail and institutional center of the city and stimulate the development of high density residential complexes.

Future development within the defined impact zone will be related to transit stations, in fact, the adjoining [illegible] the three sections have developed or will develop a [illegible] concentric land use pattern, consisting of business and commercial uses closest to the station, followed by medium to high density multi-family development, and [illegible] low density residential development.

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Summary: South Shore Rail Rapid Transit Extension, Preliminary Impact Study.

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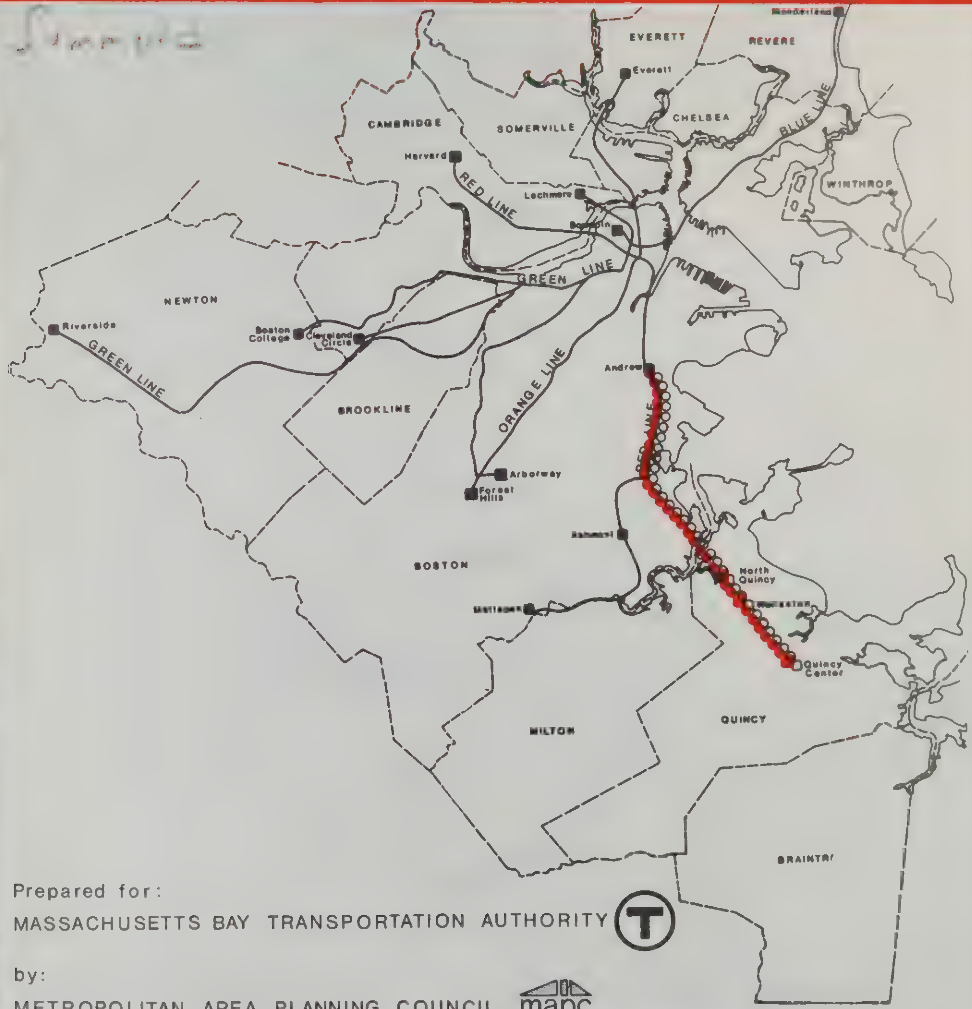
SUMMARY
SOUTH SHORE
RAIL RAPID TRANSIT EXTENSION
Preliminary Impact Study

Summary


Wonderland
EVERETT
REVERE
Everett
CAMBRIDGE
SOMERVILLE
CHELSEA
BLUE LINE
Harvard
RED LINE
Lechmere
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Bowdoin
GREEN LINE
NEWTON
Riverside
Boston College
Cleveland Circle
GREEN LINE
Andrew
BROOKLINE
ORANGE LINE
RED LINE
Arborway
Forest Hills
Ashmont
BOSTON
North Quincy
Wollaston
Mattapan
Quincy Center
MILTON
QUINCY
BRAINTREE

Prepared for:

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY

by:

METROPOLITAN AREA PLANNING COUNCIL

October, 1973

IMPACTS ON TRAFFIC VOLUMES AND PATTERNS

The study data clearly indicates that at the time of the survey, Spring 1972, the transit extension neither significantly reduced total inbound average daily highway traffic nor reversed the trend toward increased peak hour volumes. However, the traffic surveys indicate that the transit extension may have reduced the peak hour volume rate of increase. The vehicular through traffic on the major highway facilities of the corridor still exhibit long term automobile growth characteristics.

Traffic demands on local roads previously used by through traffic decreased while those roads which could provide access to the transit stations increased, especially during the peak hours (7:00 - 9:00 A.M.). This indicates that the Quincy Rapid Transit Stations are the focal points of commuters in the immediate environs of the stations. Increased orientation towards transit, in conjunction with the opportunity for many people to walk to the transit station instead of driving into Boston, has reduced the peak hour traffic volumes on local roads once utilized for through traffic purposes between Quincy and Boston.

Buses were significantly impacted by the opening of the transit extension. After the transit line became operational, the South Shore bus routes were reorganized to serve the extension. A general decline in ridership, particularly in the immediate station areas, was experienced. The largest declines occurred in Quincy where alternative modes of travel to the stations, walk, kiss-ride, were greatest. However, moving away from Quincy, the feasible alternatives to buses decline, and the attractiveness of feeder bus service increases. As a result, those communities further away experienced increases in feeder bus ridership.

The new park and ride facilities have provided the South Shore commuter with an additional opportunity to gain access to the transit line. A separate MBTA survey indicated that 88% of the park riders had not utilized transit parking facilities before the opening of the Line. The parking facilities have improved the journey for these users and have attracted new transit riders. These facilities are also reducing some of the flow of traffic into Boston from the South Shore communities.

PURPOSE

The Massachusetts Bay Transportation Authority's South Shore Rapid Transit Extension, the first phase of which opened to Quincy Center in 1971, was the Authority's first high speed rail rapid transit link between Boston and suburban communities. Realizing that a project of this magnitude would have far reaching effects on transportation and regional growth, the Massachusetts Bay Transportation Authority (MBTA) contracted with the Metropolitan Area Planning Council (MAPC) to study the impacts related to the transit extension. The study was financially assisted by the Urban Mass Transportation Administration (UMTA). The major goal of the study is to increase the understanding of transit extension impacts, with a view towards the planning of future transit extensions.

The South Shore Rail Rapid Transit Extension, has begun to fulfill a long standing need for effective mass transportation in the South Shore Corridor. Similar to major transportation improvements in any area, the transit extension has had numerous impacts. The following is a summary of the full length report which is available from the MBTA. This summary briefly discusses the major impacts of the South Shore Extension which is currently operating to Quincy Center. The second phase, further extension of the line to provide a direct connection to the region's expressway network, is now in the design-environmental analysis stage.

HISTORY

Railroad service has been an integral part of the South Shore transportation system since 1845 when the Old Colony Railroad was opened from Boston to Plymouth. In 1959, however, faced with spiraling operating costs and no subsidy payments (the line received a $900,000 subsidy from area municipalities in 1958) the Old Colony ceased passenger service. There had been proposals for electrified rail transit service as far back as 1926 (Commonwealth of Massachusetts, Division of Metropolitan Planning, Report on Improved Transportation Facilities in the Boston Metropolitan District). In 1964 the top priority for the newly created MBTA was the extension of rail rapid transit service to the South Shore. Construction began in the spring of 1966 and by September of 1971 the extension to Quincy Center had become a reality.

The preparation of this report has been financed in part through a grant from the U.S. Department of Transportation, Urban Mass Transportation Administration, under the Urban Mass Transportation Act of 1964, as amended.

CONCLUSIONS

TRAVEL CHARACTERISTICS

- In two years, daily ridership (two-way) has increased by 55% (from 18,750 in Sept. 1971 to 28,990 in Nov. 1973).
- 93% of the riders saved time, or experienced no change in travel time.
- 67% of the riders required no transfer to reach their destination.
- Almost half of the riders arrive at the stations by automobile compared with 36% for the Riverside Line, 30% for the Blue Line and 12% for the Red and Orange Lines.
- 81% of the riders use the line to commute to work, 9% are going to school, 4% are on personal business journeys and the remaining 6% have shopping, recreational or other uses.
- Quincy (56%), Weymouth (11%), and Braintree (9%) are the origins of 76% of the riders.
- The destination of the riders is predominantly downtown Boston (74%).
- Local riders, travelers between South Shore stations, are 6% of all riders.
- The peak period of inbound transit use on the line is between 7 AM & 9 AM.
- Walking, as a mode of station access, was greater than anticipated, buses were lower than anticipated, and automobile use was approximately as anticipated.
- Quincy Center Station, temporarily serving as the terminal, suffers from congestion because it was not intended to accommodate the high travel demands of a terminal facility.
- Originally, the line was planned to extend beyond Quincy Center with two major highway intercept stations along Routes 3 & 128. Without these stations, the market penetration of the Line has been limited. The Line's ability to attract additional riders from other South Shore communities is dependent on its further extension and improved highway accessibility.

RIDER CHARACTERISTICS

- 45% of the riders are new transit users; of these two-thirds drove before the Line opened, and a surprising one-third never made the trip before.
- 55% of the riders are previous transit users experiencing shorter travel times and fewer transfers.
- Almost 60% of the riders chose to use the transit line because of time considerations, only 12% were converted because of the lower cost and 19% used the service because a car was not available.
- 8% of the riders stated that they relocated their housing as a result of the Extension; 5% took a new job; 1.4% sold their car; 6% changed shopping habits and 1% changed schools.

- The socio-economic characteristics of the transit rider closely correlates with the average South Shore resident. The average rider is 30 years old, owns his own home,has access to a car, and has a family income of about $14,000 per year.

- The ridership comments were generally favorable to the new extension. There was considerable sentiment for extending the line beyond Quincy Center and many comments referred to maintaining scheduled headways and extension of bus feeder service.

TRAFFIC IMPACTS

- The Line has not yet has a significant affect on major highway traffic volumes.

- Parking facilities at Quincy Center are filled to capacity by 8AM. The "park-ride" spillover from the terminal facility is being absorbed at the Wollaston and North Quincy Stations.

- The new parallel roadway linking the three stations together has provided good local access to all three stations.

- Bus ridership has decreased in areas adjacent to the stations, but increased in outlying areas. The net result has been a 9% savings in bus operating mileage.

ECONOMIC IMPACTS

- The transit extension has broadened the employment base of Quincy. Labor intensive, non-manufacturing service industries (banking, insurance, and "home office" firms) have located near station sites because the transit system provides the best access for prospective employees.

- $81 million in residential and commercial development has occurred in Quincy over a three year period (1969-1972); 75% of this development is located in areas adjacent to the transit stations.

- The new developments have substantially expanded the tax base of Quincy.

- To date, there is no indication that the transit extension alone can strongly revitalize retail trade in Quincy Center.

- Additional major development focusing on the North Quincy and Quincy Center station areas is anticipated.

LAND USE

- Because the City of Quincy prepared for the extension with a comprehensive arterial roadway improvement program, a comprehensive land development program, and a rezoning effort to encourage new and desirable development, the impacts of the extension have been beneficial to the community.

- Land uses adjacent to the transit stations tend to be business, commercial or high residential density land uses, with lower densities beyond.

ENGINEERING DESIGN ASPECTS

The South Shore Rapid Transit Extension is a double track line 6.1 miles long. It extends southerly from a high speed junction (tunnel and overpass interchange) with the existing Red Line south of the subway portal to a 950 ft. long aerial grade-separated, railroad freight track flyover in the Savin Hill section of Boston. The line proceeds on the former Old Colony railroad embankment to the Neponset River, which separates Boston and Quincy. The river is spanned by a double track 1,185 ft. weathering steel bridge standing 30 ft. above mean high water. The line then runs at grade through North Quincy and Wollaston stations to 4,000 foot long open cut depressed section between Adams and School Streets. Quincy Center Station and its 875 car parking garage straddle the depressed section 1,480 ft. south of Adams Street. The line's trackwork consists of 115 lb. welded rail seated on concrete ties with elastic pads.

SYSTEM STATISTICS

Length of Line - 6.10 miles
No. of Stations - 3 (North Quincy, Wollaston, Quincy Center)
No. of Tracks - 2 - space for third
No. of Cars - 76 purchased
Seats - 52 single end cars, 68 seats - 24 double end cars, 64 seats
Car Length - 70 ft.; Width - 10 ft., 4 in.; No. of Doors - 3 per side
Crush capacity - 180 passengers
Average capacity - 157 passengers
Top speed - 65 miles per hour
Acceleration - 2.5 miles per hour per second
Train operation - Peak-4 car trains; off-peak - 2 car trains
Running Time - 9 min. from South Shore Jct. to Quincy Ctr.
Space between Stations - 2.03 mi. avg.; o.78 mi. min.; 4.05 mi. max.
Schedule Speed - 40.67 mph South Shore Jct.-Quincy Ctr.
28.22 mph Harvard-Quincy Ctr.
Dwell time at stations - 15-30 sec.
Station Platform Length - 440 ft.
AM Headway - 4-8 min. 12 trains arr. Wash. Station 8-9 AM
PM Headway - 4-8 min. 10 trains lv. Wash. Station 5-6 PM
Midday and Nite Headway - 8 min. mid-day, 8-15 min. evening
Hours of operation - 5:00 AM to 1:00 AM (20 hours)
Capital cost - $75 million
Total Parking Spaces - 2,200
Fare - 50¢; 25¢ for local riders and elderly; 15¢ for students
Signal System - ATO - Automatic Control of speed spacing and merging of lines
Traction Power - Third Rail - 600 volt dc
No. of Grade Separated Crossings Rebuilt - 13
No. of Power Substations - 5
No. of Feeder Bus Routes - 20
Area Bus Riders (Before) - 23,455
Feeder Bus Riders (After) - 14,384
Monthly Bus Mileage (Before) - 217,884
Monthly Bus Mileage (After) - 199,036

LAND USE IMPACTS

The transit extension has had and will continue to have major impacts on land use in the North Quincy area. Wollaston Station will create the least amount of land use changes because undeveloped land is not readily available. In Quincy Center, the terminal facility has begun to bolster the existing commercial land uses and will probably significantly increase residential densities. The three stations, therefore, serve three different land use areas, i.e., North Quincy Station supports the new finance and service industry center of Quincy; Wollaston serves a residential neighborhood of low to medium density and may possibly stimulate more intensive commercial uses in the local shopping area; and Quincy Center Station buttresses the retail, institutional and high density residential activities in the city center.

ECONOMIC IMPACTS

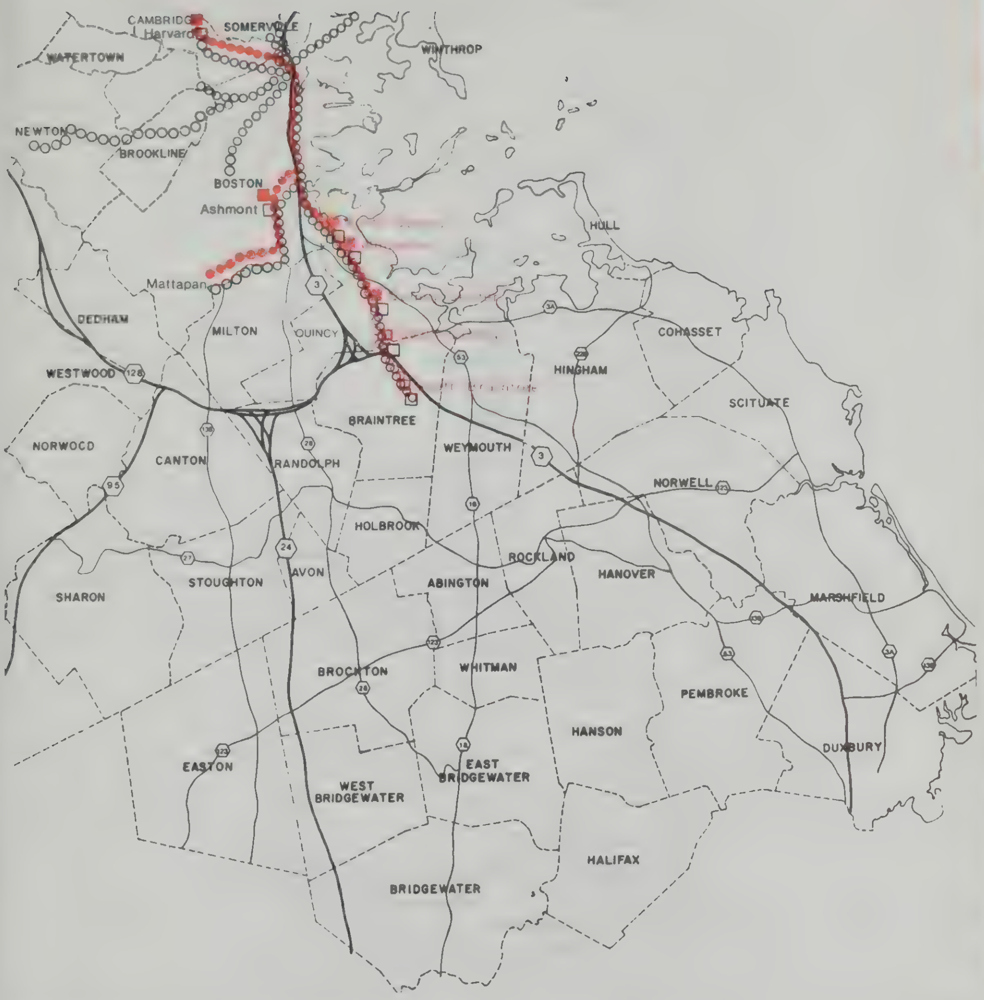
The economy of Quincy is experiencing a change in the structure of its economic base; from one dominated by manufacturing to a more balanced economy where service, finance and insurance developments are the new industries. Rail rapid transit by virtue of its ability to support intensive land uses near stations and to provide access to the labor pool required by the finance and insurance industries, is making this transition a less disruptive experience for Quincy.

Transit, however, has not, to date revitalized retail trade in Quincy, since it alone is unable to offset other barriers to a revival of retail trade, i.e., poor automobile access from major South Shore expressways, obsolete retail facilities, and lack of expansion space. Similarly, the transit service has had little effect on manufacturing employment; its decline in this area being a reflection of a statewide trend. The transit service has not, and probably can not to any great degree, restore the historic economic base of Quincy (manufacturing) to its former stature. However, it has aided in the establishment of a new economic base, (insurance, finance, and service industries) which, without the transit service, may never have materialized, or been long delayed.

FUTURE PLANNING CONSIDERATIONS

Although the Line has attracted new transit ridership and improved service to previous transit users, the study indicates that an extension of the transit line to South Quincy and Braintree would maximize the benefits that can be derived from a transit line in the South Shore Corridor by making transit more available to towns south of Quincy.

With an extension deeper into the corridor and a more efficient interface of major transit and highway facilities, there would be more opportunities for the extension to reduce peak hour traffic on the highway system.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SOMERVILLE
WINTHROP
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NEWTON
BROOKLINE
BOSTON
Ashmont
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Mattapan
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DEDHAM
MILTON
QUINCY
COHASSET
53
228
HINGHAM
WESTWOOD
128
SCITUATE
BRAINTREE
138
28
NORWOOD
CANTON
RANDOLPH
WEYMOUTH
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NORWELL
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95
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HOLBROOK
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ROCKLAND
HANOVER
SHARON
STOUGHTON
AVON
ABINGTON
MARSHFIELD
139
123
WHITMAN
BROCKTON
28
3A
139
PEMBROKE
HANSON
DUXBURY
123
18
EASTON
EAST BRIDGEWATER
WEST BRIDGEWATER
HALIFAX
BRIDGEWATER

SOUTH SHORE CORRIDOR

N

0 5 10 15 20

scale in thousands feet

LEGEND

— Limited Access Highways

— Secondary Highways

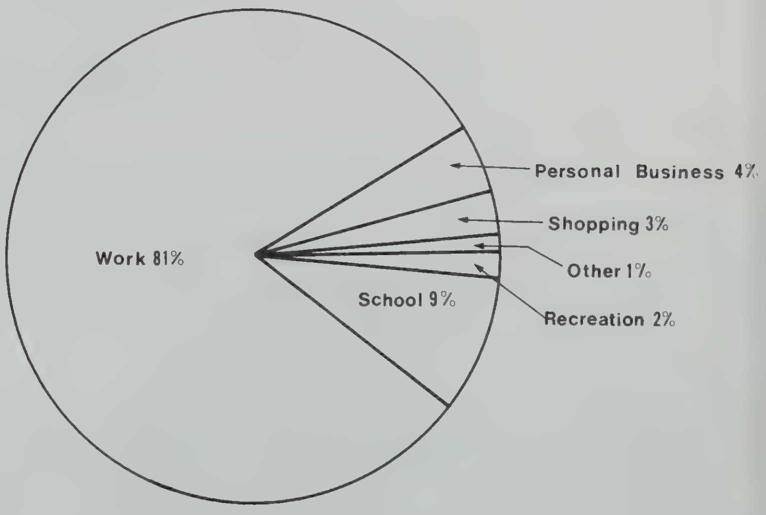
○○○ Rapid Transit System

☐ Station Names

MBTA-MAPC Survey
South Shore Transit Line
October 1973

PURPOSE OF TRIP

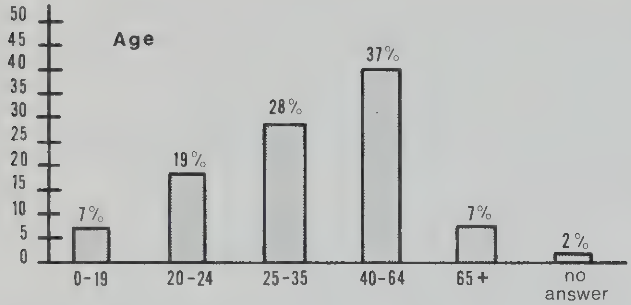
(South Shore Transit Riders)

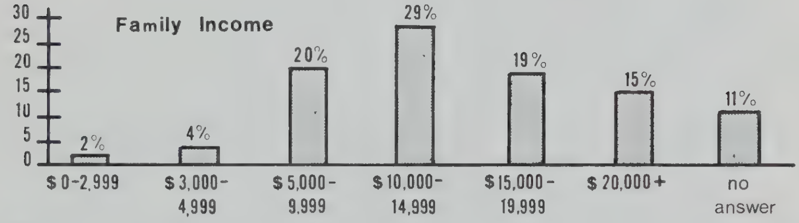


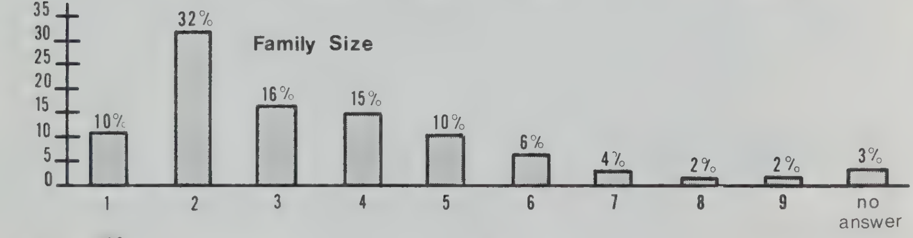
(All Day)

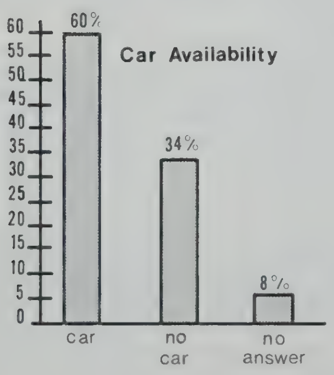
MBTA - MAPC Survey
South Shore Transit Line
April, 1972

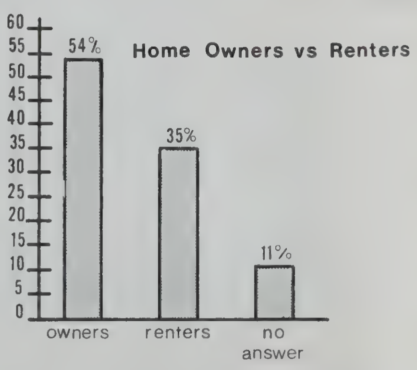
RIDERSHIP COMPOSITE











MBTA - MAPC Survey
South Shore Transit Line
April, 1972

WRITTEN COMMENTS

The ridership survey forms included a space for written comments. There were a total of 5,206 written comments made by 3,044 riders, while 873 riders chose not to comment. The average number of written comments per returned questionnaire was 1.3 (5,206/3,917). The comments were coded into 100 individual calssifications and grouped into the following categories:

Table 1

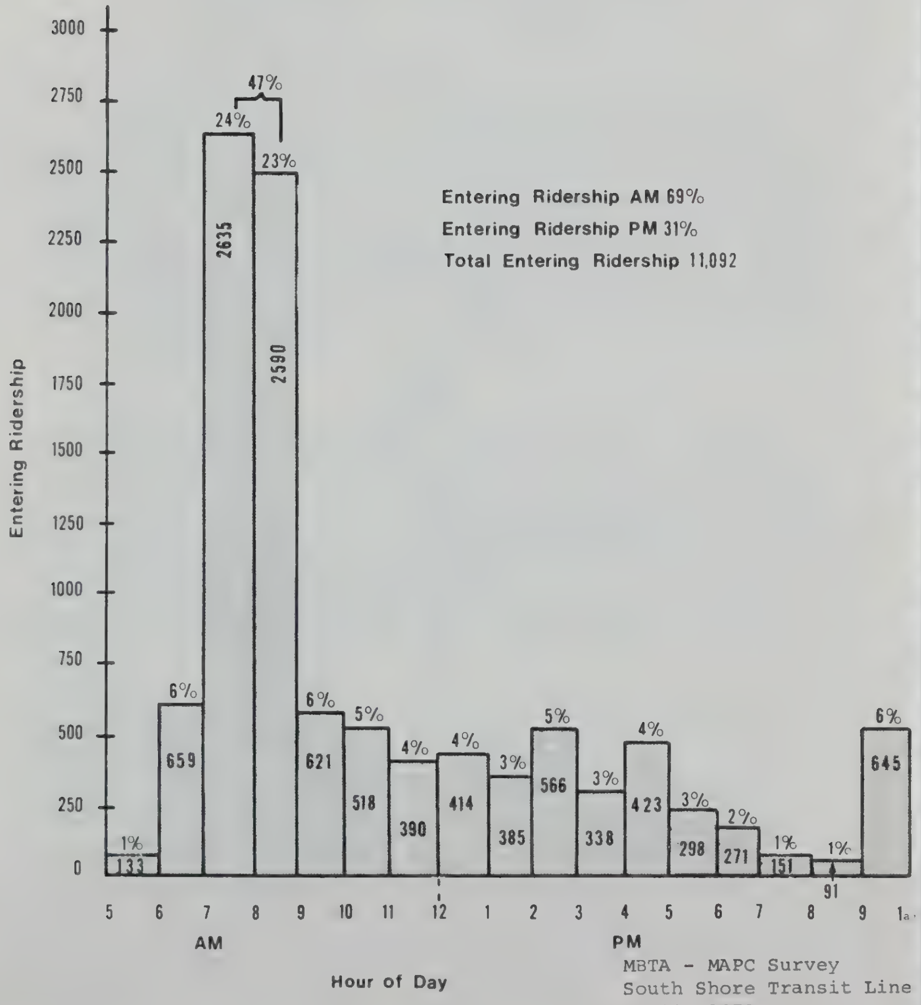
GENERALIZED COMMENTS

Group	Description	Number of Responses	Percent of Responses
A	Improve Service, Operations, etc.	1978	38%
B	Safety, Security, Courtesy	634	12%
C	Improve Stations	557	11%
D	Improve Trains	475	9%
E	Bus Service	447	9%
F	Further Extension Southerly	275	5%
G	Fares, Deficit	232	4%
H	Improve other MBTA Service	202	4%
I	Parking	151	3%
J	Other Comments	255	5%
	Comments Subtotal	5,206	100%
K	No Responses	873	
	Grand Total	6,079	

The largest group of comments refers to keeping the service reliable; i.e., the trains must be at the platform ready for use at some reasonable frequency and consistency. This appeared to be the overriding issue raised by the written comments. There were also 391 individual comments stating that riders were pleased with the service. This represents 7% of the total comments. There were also 270 individual comments (5%) requesting a further extension to the south. Considering that these were written and unsolocited, and that comments tend to be generally critical; these two comments indicate a general satisfaction with the service. Indeed, a summary evaluation of the total comments received could be interpreted as "you did a decent job in getting the line out here and we're pleased, but keep the service running regularly, maintain equipment and stations, provide more and better bus access, provide parking and we don't mind paying a reasonable out-of-pocket cost if this whole package of public transportation services really works".

ENTERING RIDERSHIP BY HOUR OF DAY (April 27, 1972)

(Turnstyle Counts At All Stations)



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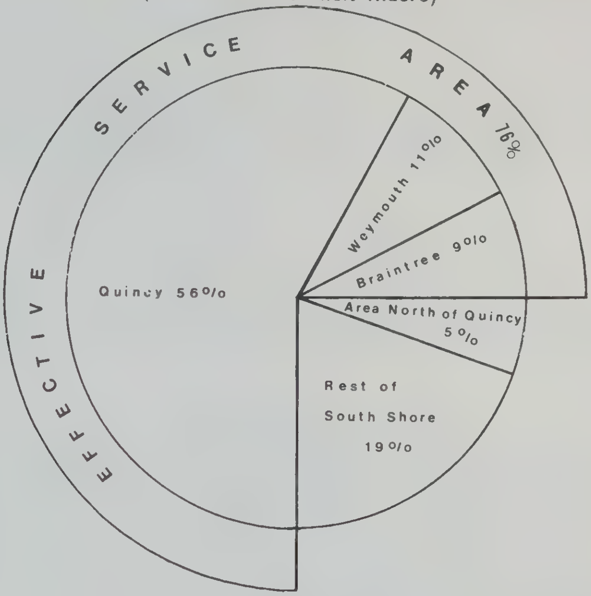
ORIGINS

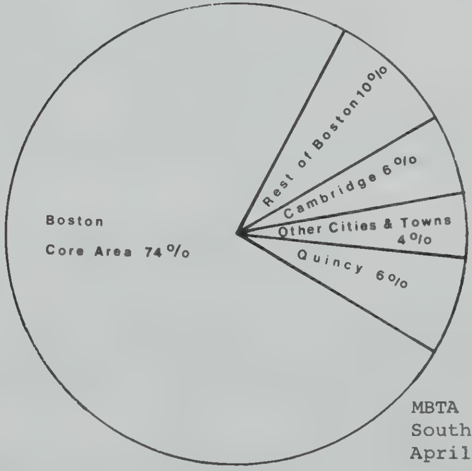
(South Shore Transit Riders)



(All Day)

DESTINATIONS

(South Shore Transit Riders)



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(All Day)

MBTA-MAPC Survey, April 1972
South Shore Rapid Transit Extension

RIDERSHIP CHARACTERISTICS

TIME OF USE

Time	%	#
5:00 - 7:00 AM	7	792
7:00 - 9:00 AM	46	5125
9:00 - NOON	14	1529
NOON - 2:00 PM	7	799
2:00 - 1:00 AM	26	2847
Totals	100	11092

PURPOSE OF TRIP

Purpose	%	#
Work	81	8984
School	9	998
Per. Business	4	444
Shopping	3	333
Recreation	2	222
Other	1	111
Totals	100	11092

REASONS FOR USE

Attitudinal

Reason	%	#
Avoid Dn Traffic	34	3771
Avoid Dn Parking	9	998
Direct Connections	15	1664
Less Travel Time	10	1109
Lower Cost	3	333
More Comfort	3	333
No Car Available	19	2107
No Bus Available	4	444
Other	3	333
Totals	100	11092

Time - Cost

Reason	%	#
Avoid Dn Traffic	34	3771
Direct Connections	15	1664
Less Travel Time	10	1109
No Car Available	19	2107
Avoid Dn Parking	9	998
No Bus Available	4	444
Lower Cost	3	333
More Comfort	3	333
Other	3	333
Totals	100	11092

PRESENT MODE TO STATION

Mode	%	#
Park & Ride	33	3660
Kiss & Ride	16	1775
Walk	32	3549
Bus	16	1775
Taxi	1	111
Other	2	222
Totals	100	11092

PREVIOUS MODE OF TRAVEL

Mode	%	#
Park-Kiss & Ride	13	1442
Bus to MBTA Station	39	4326
Drove or Rode	29	3216
New Trip	16	1775
Other	3	333
Totals	100	11092

ORIGINS

Origin	%	#
Quincy	56	6212
Weymouth	11	1220
Braintree	9	998
North of Quincy	5	555
Rest of South Shore	19	2107
Totals	100	11092

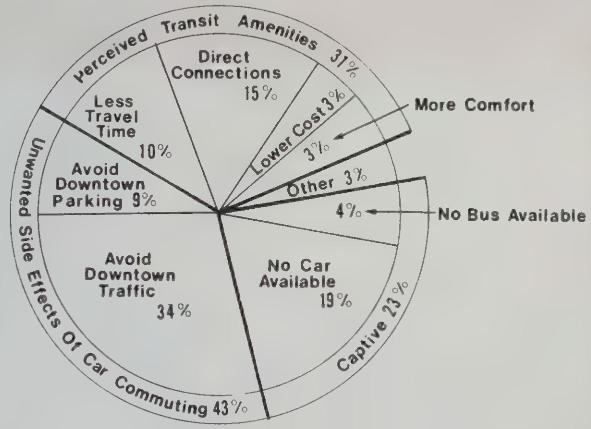
DESTINATIONS

Destination	%	#
Boston Core	74	8207
Rest of Boston	10	1109
Cambridge	6	666
Quincy	6	666
Others	4	444
Totals	100	11092

REASONS FOR USE

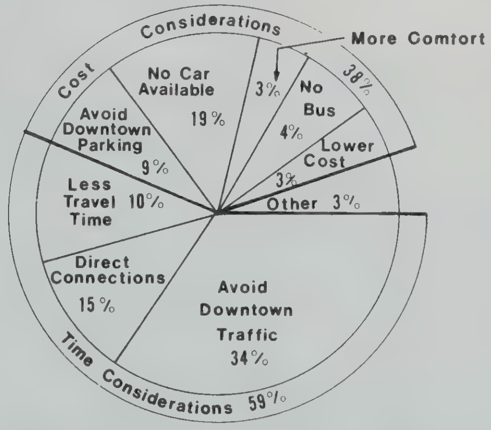
(South Shore Transit Riders)

ATTITUDES



(All Day)

TIME AND COST



(All Day)

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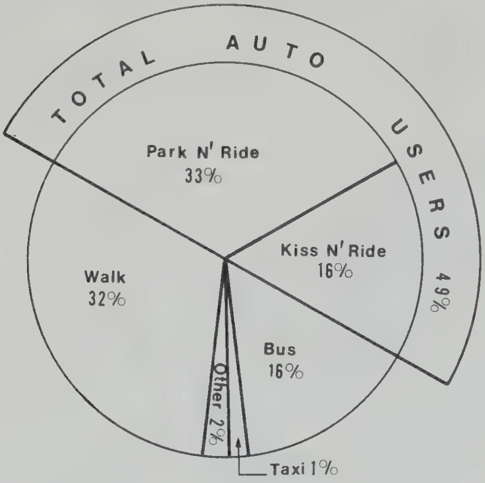
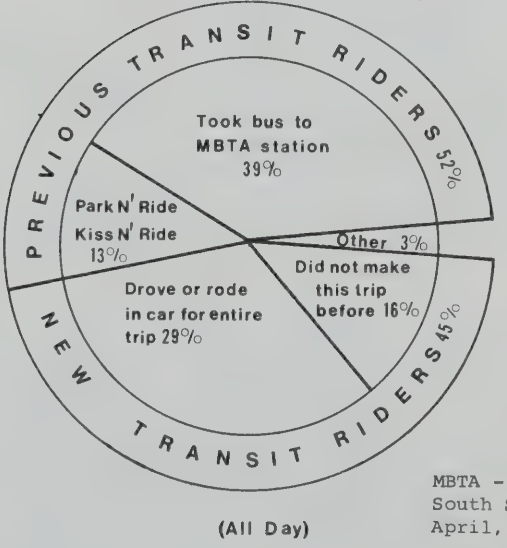
April, 1972

PRESENT MODE TO STATION
(South Shore Transit Riders)



(All Day)

PREVIOUS MODE
(South Shore Transit Riders)



(All Day)

MBTA - MAPC Survey
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